



(19)中華民國智慧財產局

(12)發明說明書公告本

(11)證書號數：TW I466978 B

(45)公告日：中華民國 104 (2015) 年 01 月 01 日

(21)申請案號：097151340

(22)申請日：中華民國 97 (2008) 年 12 月 30 日

(51)Int. Cl. : *C09K11/06 (2006.01)* *C07C15/62 (2006.01)*
C07D213/72 (2006.01) *C07D333/76 (2006.01)*
C07D307/91 (2006.01) *C07D209/88 (2006.01)*
C07D307/06 (2006.01) *C07D333/36 (2006.01)*
H01L51/50 (2006.01) *H01L31/04 (2014.01)*

(30)優先權：2007/12/31 南韓 10-2007-0142000

(71)申請人：葛來西雅帝史派有限公司 (南韓) GRACEL DISPLAY INC. (KR)
南韓

(72)發明人：陰盛鎮 EUM, SUNG JIN (KR)；趙英俊 CHO, YOUNG JUN (KR)；權赫柱 KWON, HYUCK JOO (KR)；金奉玉 KIM, BONG OK (KR)；金聖珉 KIM, SUNG MIN (KR)；尹勝洙 YOON, SEUNG SOO (KR)

(74)代理人：洪武雄；陳昭誠

(56)參考文獻：

CN 1918261A

JP 2005-174735A

審查人員：陳依微

申請專利範圍項數：9 項 圖式數：1 共 293 頁

(54)名稱

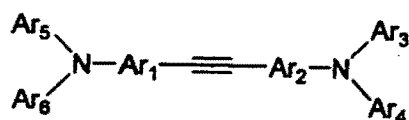
新穎有機電致發光化合物及使用該化合物之有機電致發光裝置

NOVEL ORGANIC ELECTROLUMINESCENT COMPOUNDS AND ORGANIC
ELECTROLUMINESCENT DEVICE USING THE SAME

(57)摘要

本發明係關於新穎有機電致發光化合物以及使用該化合物作為電致發光材料之有機電致發光裝置。具體而言，根據本發明之有機電致發光化合物的特徵在於其為如化學式(1)所示：

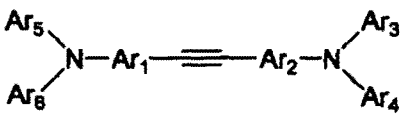
化學式(1)



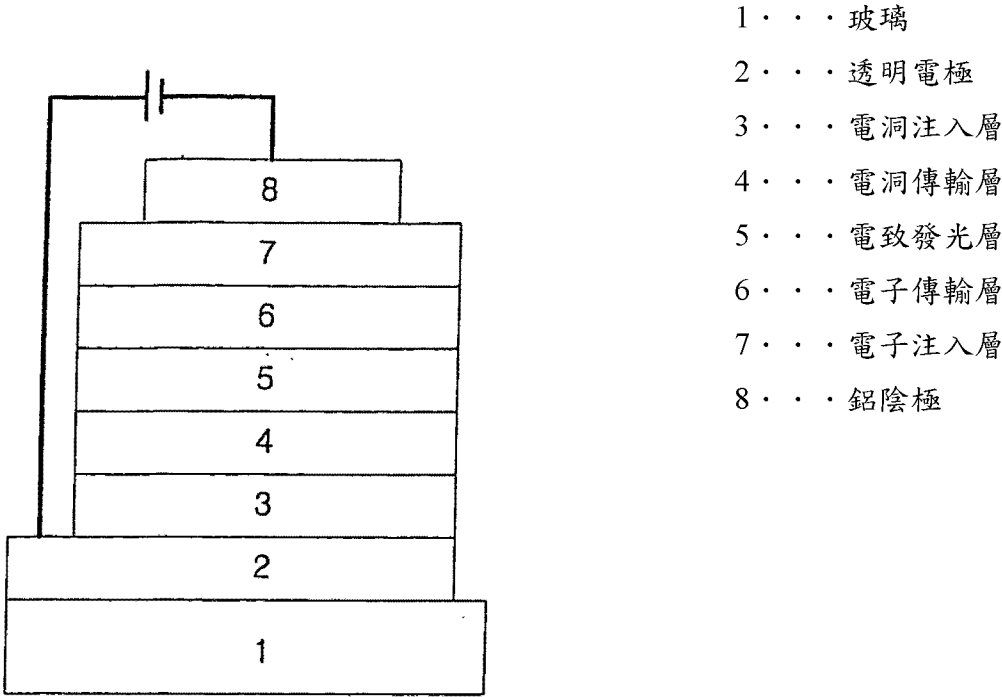
由於根據本發明之有機電致發光化合物具有優異發光效率及優異的材料壽命性能，因此可製造具有非常優異操作壽命之 OLED。

The present invention relates to novel organic electroluminescent compounds, and organic electroluminescent devices employing the same as electroluminescent material. Specifically, the organic electroluminescent compounds according to the invention are characterized in that they are represented by Chemical Formula (1) :

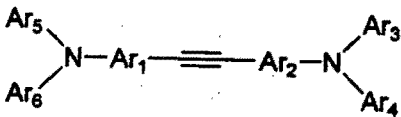
Chemical Formula 1



Since the organic electroluminescent compounds according to the invention have good luminous efficiency and life property of material, OLED's having very good operation lifetime can be manufactured.



第 1 圖



(本說明書格式、順序，請勿任意更動，※記號部分請勿填寫)

609K 1/6 (2006.01)

※IPC 分類: 609C 17/62 (2006.01)

CO9C 17/62 (2006.01)

(090) $2^{13}/92$ (2006.01)

6910 333/96 (2006.01)

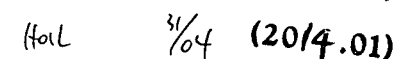
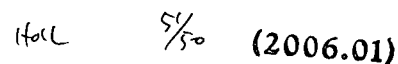
NOVEL ORGANIC ELECTROLUMINESCENT COMPOUNDS AND ORGANIC

30% (2006.01)

CO911 209/88 (2006.01)

CO90 307/66 (2006.01)

6070 $\frac{333}{36}$ (2006.01)

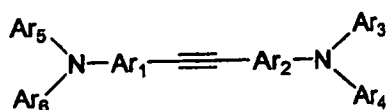


[5]

三、英文發明摘要：

The present invention relates to novel organic electroluminescent compounds, and organic electroluminescent devices employing the same as electroluminescent material. Specifically, the organic electroluminescent compounds according to the invention are characterized in that they are represented by Chemical Formula (1):

Chemical Formula 1



Since the organic electroluminescent compounds according to the invention have good luminous efficiency and life property of material, OLED's having very good operation lifetime can be manufactured.

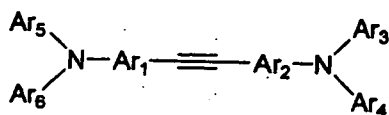
四、指定代表圖：

(一)本案指定代表圖為：第 (1) 圖。

(二)本代表圖之元件符號簡單說明：

- 1 玻璃
- 2 透明電極
- 3 電洞注入層
- 4 電洞傳輸層
- 5 電致發光層
- 6 電子傳輸層
- 7 電子注入層
- 8 鋁陰極

五、本案若有化學式時，請揭示最能顯示發明特徵的化學式：



六、發明說明：

【發明所屬之技術領域】

本發明係關於新穎有機電致發光化合物以及使用該化合物作為電致發光材料之有機電致發光裝置。

【先前技術】

在顯示裝置中，電致發光(electroluminescence)裝置(EL裝置)係顯示廣視角、優異對比度及快速反應速率之自發光顯示裝置。1987年，Eastman Kodak第一次發展使用低分子量的芳香族二胺及鋁錯合物作為形成EL層材料之有機EL裝置[Appl. Phys. Lett. 51, 913, 1987]。

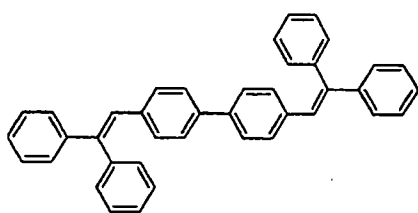
決定有機EL裝置之發光效率、壽命等的最重要的因素是電致發光材料。此等電致發光材料所需的幾項性能包括材料在固態時具有高螢光量子產率及電子及電洞之高遷移率，在真空中的氣相沉積期間不易分解，且形成均勻並安定的薄膜。

有機電致發光材料通常可分類為高分子材料及低分子材料。低分子材料從分子結構方面來看包括金屬錯合物及不含金屬的純有機電致發光材料。此類電致發光材料包括螯合錯合物諸如：參(8-羥基喹啉)鋁錯合物、香豆素衍生物、四苯基丁二烯衍生物、雙(苯乙烯基伸芳基)(bis(styrylarylene))衍生物、噁二唑衍生物。據報導，從這些材料可獲得自藍色至紅色之可見光區發光，因此預期全色顯示裝置的實現。

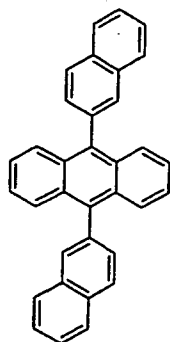
同時，就藍色材料而言，自從 Idemitsu-Kosan 發展

DPVBi(化學式 a)，已發展並商品化大量的材料。除了來自 Idemitsu-Kosan 的藍色材料系統之外，已知二萘基蔥(化學式 b)、四(第三丁基)芘(化學式 c)系統等。然而，還應對這些材料進行廣泛的研究和發展。迄今為止，已知具最高效率之 Idemitsu-Kosan 之二苯乙烯基化合物系統具有功率效率為 6 流明/瓦(lm/w)，有效裝置壽命超過 30,000 小時。但是，當其施用於全色顯示器時，由於隨著操作時間色彩純度減少，因此壽命僅為幾千小時。在藍色電致發光的例子中，當電致發光波長稍微向較長波長偏移時，從發光效率方面來看藍色電致發光變得具有優勢。但是，由於令人不滿的藍色色彩純度，不易將其施用於高品質的顯示器中。此外，由於色彩純度、效率及熱安定性方面的問題，因此需急切研究及發展此等材料。

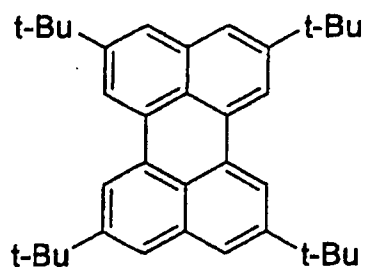
化學式 a



化學式 b



化學式 c



【發明內容】

因此，本發明人密集致力於克服上述問題並發展新穎電致發光化合物，該化合物可實現具有優異的發光效率，並且裝置壽命顯著改善之有機電致發光裝置。

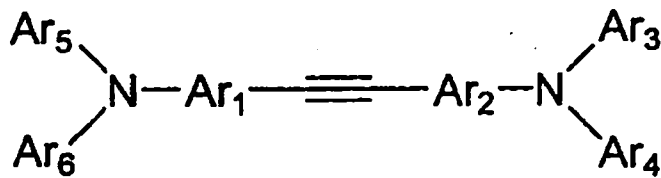
本發明之目的在於克服上述藍色材料的缺點，並提供具有改善之發光效率及裝置壽命之有機電致發光化合物。

本發明之另一目的在於提供具有高效率及長壽命之有機電致發光裝置，該裝置包括上述有機電致發光化合物作為電致發光材料。本發明之另一目的在於提供包括電致發光區之有機電致發光裝置，該電致發光區除了使用一種或多種上述有機電致發光化合物之外，還使用一種或多種選自蔥衍生物之化合物及苯并[a]蔥衍生物之化合物作為電致發光主體(host)材料。

本發明之又一目的在於提供包括該新穎有機電致發光化合物之有機太陽能電池。

具體而言，本發明係關於由化學式(1)所示之新穎有機電致發光化合物以及於電致發光層中使用該化合物之有機電致發光裝置。

化學式(1)



其中，

Ar₁ 與 Ar₂ 係獨立地表示 (C6-C60) 伸芳基或 (C5-C60) 雜伸芳基，並且 Ar₁ 與 Ar₂ 之伸芳基或雜伸芳基可進一步經一個或多個選自氘、直鏈或分支鏈 (C1-C60) 烷基、及 (C6-C60) 芳基之取代基取代；

Ar₃ 至 Ar₆ 係獨立地表示直鏈或分支鏈 (C1-C60) 烷基、(C3-C60) 環烷基、含有一個或多個選自 N、O 及 S 之雜原子之 5 員或 6 員雜環烷基、(C6-C60) 芳基或 (C3-C60) 雜芳基；以及

Ar₃ 至 Ar₆ 之芳基或雜芳基可進一步經一個或多個選自下列所組成群組之取代基取代：氘、含有或不含有直鏈或分支鏈 (C1-C60) 烷基或 (C6-C60) 芳基取代基之 (C6-C60) 芳基、含有或不含有鹵素取代基之直鏈或分支鏈 (C1-C60) 烷基、(C1-C30) 烷氧基、(C3-C60) 環烷基、鹵素、氰基、三 (C1-C30) 烷基矽烷基、二 (C1-C30) 烷基 (C6-C30) 芳基矽烷基及三 (C6-C30) 芳基矽烷基。

【實施方式】

現參照圖式，第 1 圖說明本發明之 OLED，其包括玻璃 1、透明電極 2、電洞注入層 3、電洞傳輸層 4、電致發光

層 5、電子傳輸層 6、電子注入層 7 及鋁(Al)陰極 8。

本文所述之術語‘烷基’、‘烷氧基’及包括‘烷基’部分之任何取代基既包括直鏈又包括分支鏈基團。

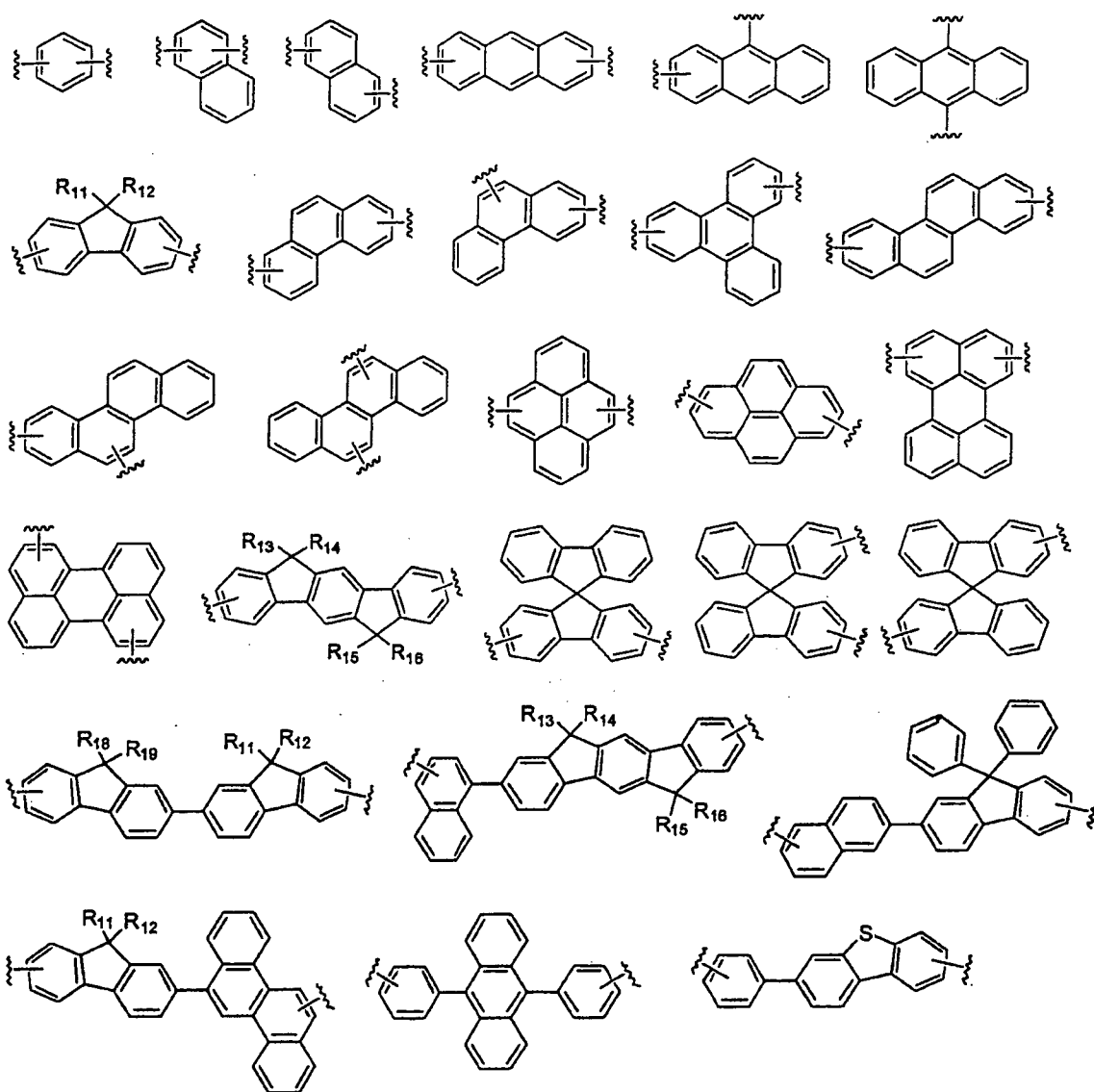
本文所述之術語‘芳基’係指自芳香族烴去掉一個氫原子而得到的有機基。每個環都包括單環或含有 4 個至 7 個、較佳含有 5 個至 6 個環原子之稠合環系統。具體例子包括，但不限於苯基、萘基、聯苯基、蒽基、四氫萘基、茚基、芴基、菲基、聯伸三苯基、芘基、芘基(perylenyl)、蒯基、稠四苯基及丙二烯合芴基。

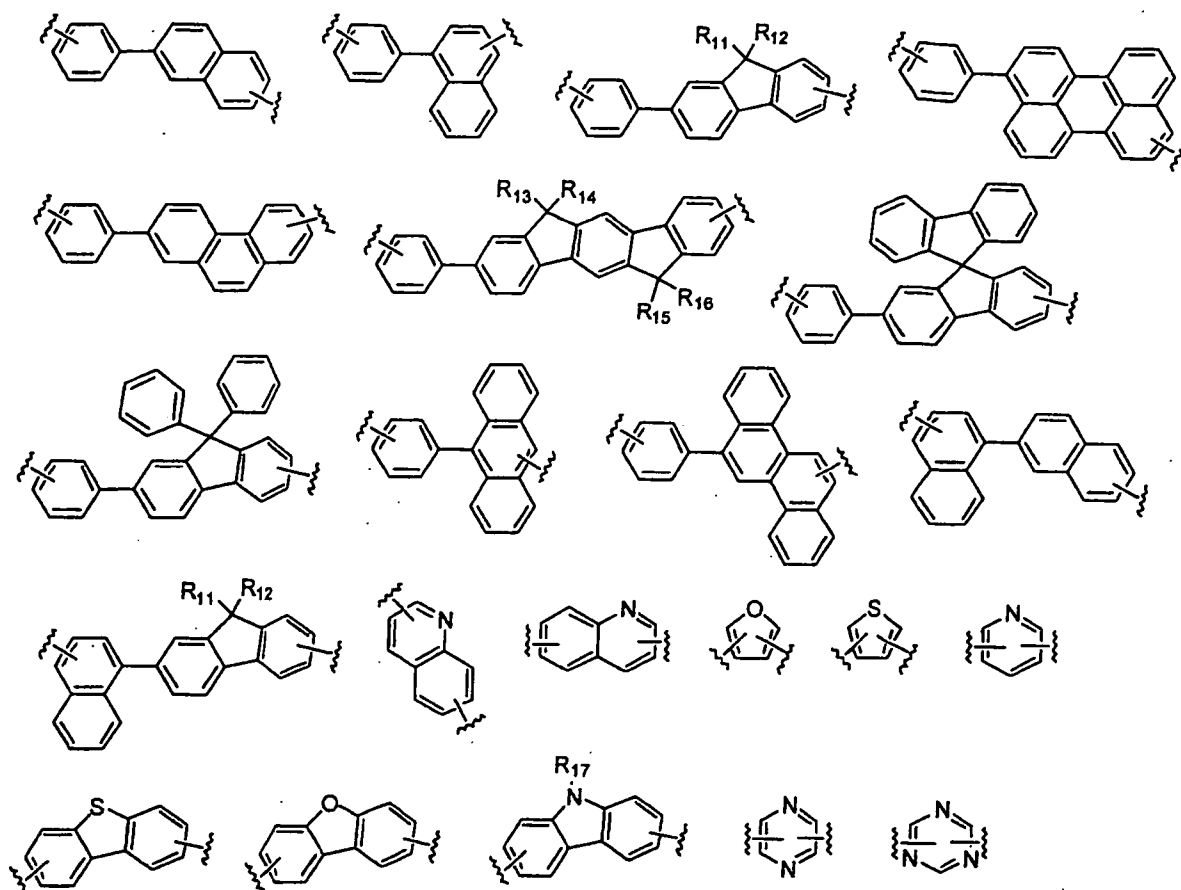
本文所述之術語‘雜芳基’係指含有 1 個至 4 個選自 N、O 及 S 之雜原子作為芳香環骨架原子以及用於維持芳香環骨架原子之碳原子的芳基。雜芳基可為 5 員或 6 員單環雜芳基或與一個或多個苯環稠合之多環雜芳基，並該雜芳基可部分飽和。雜芳基可包括二價芳基，其中雜原子可經氧化或四級化以形成 N-氧化物及四級鹽。具體例子包括，但不限於單環雜芳基，諸如呋喃基、噻吩基、吡咯基、咪唑基、吡唑基、噻唑基、噻二唑基、異噻唑基、異噁唑基、噁唑基、噁二唑基、三吡基、四吡基、三唑基、四唑基、呋吡基、吡啶基、吡嗪基、嘧啶基、嗒吡基；多環雜芳基，諸如苯并呋喃基、苯并噻吩基、異苯并呋喃基、苯并咪唑基、苯并噻唑基、苯并異噻唑基、苯并異噁唑基、苯并噁唑基、異吲哚基、吲哚基、吲唑基、苯并噻二唑基、喹啉基、異喹啉基、噌啉基、喹啉基、喹噁啉基、咔唑基、啡啶基及苯并二噁呋基(benzodioxolyl)；及相對應之 N-

氧化物(例如,吡啶基 N-氧化物、喹啉基 N-氧化物)及其四級鹽。

包括本文所述之‘(C1-C60)烷基’部分之取代基可含有 1 個至 60 個碳原子、1 個至 20 個碳原子或 1 個至 10 個碳原子。包括‘(C6-C60)芳基’部分之取代基可含有 6 個至 60 個碳原子、6 個至 20 個碳原子或 6 個至 12 個碳原子。包括‘(C3-C60)雜芳基’部分之取代基可含有 3 個至 60 個碳原子、4 個至 20 個碳原子或 4 個至 12 個碳原子。包括‘(C3-C60)環烷基’部分之取代基可含有 3 個至 60 個碳原子、3 個至 20 個碳原子或 3 個至 7 個碳原子。包括‘(C2-C60)烯基或炔基’部分之取代基可含有 2 個至 60 個碳原子、2 個至 20 個碳原子或 2 個至 10 個碳原子。

於化學式(1)中, Ar₁ 與 Ar₂ 獨立地選自下列結構, 但不限於下列結構:





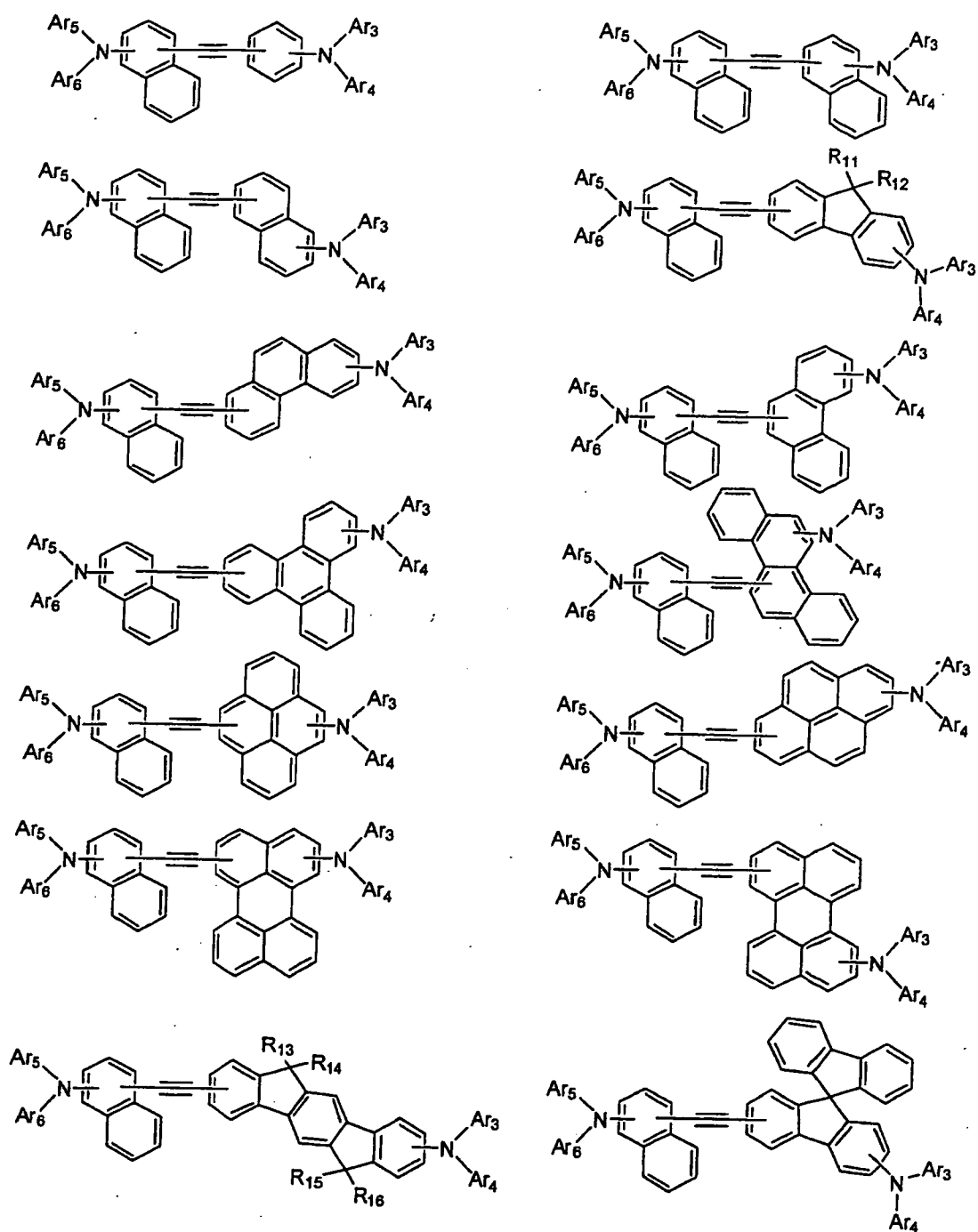
其中，R₁₁至R₁₉係獨立地表示氫、直鏈或分支鏈(C1-C60)烷基或(C6-C60)芳基，並且芳基可進一步經直鏈或分支鏈(C1-C60)烷基取代。

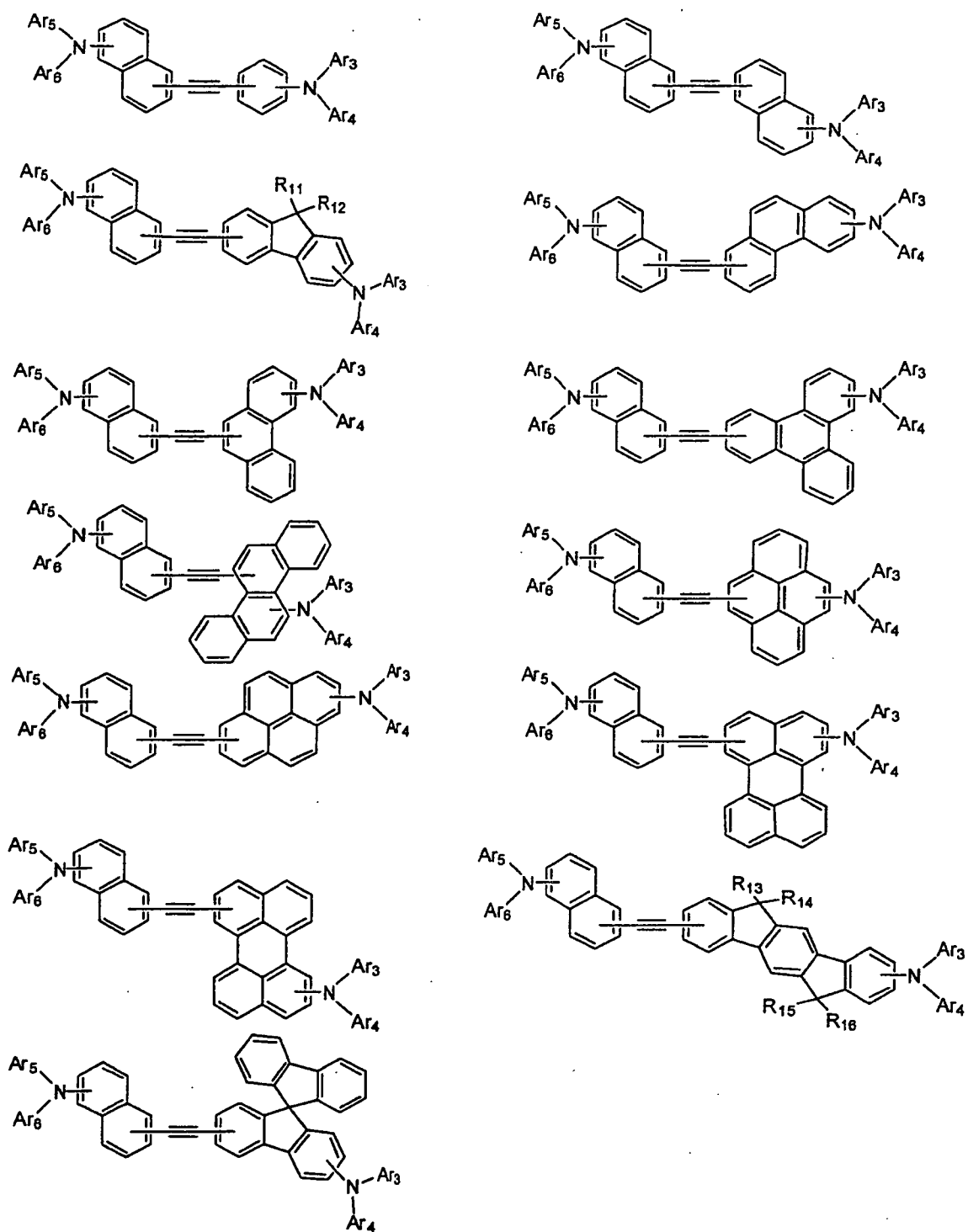
於化學式(1)中，Ar₃至 Ar₆係獨立地表示苯基、萘基、蒽基、蔥基、菲基、芑基、芘基(perylenyl)、丙二烯合蒽基、吡啶基、吡咯基、呋喃基、噻吩基、咪唑基、苯并咪唑基、吡嗪基、嘧啶基、嗒嗪基、喹啉基、三嗪基、苯并呋喃基、苯并噻吩基、吡唑基、引哚基、卟唑基、噻唑基、𩇓唑基、苯并噻唑基、苯并𩇓唑基、N-嗎啉基或硫代 N-嗎啉基；以及該苯基、萘基、蒽基、蔥基、菲基、芑基、芘基(perylenyl)、丙二烯合蒽基、吡啶基、吡咯基、呋喃基、噻吩基、咪唑基、苯并咪唑基、嗒吡嗪基、嘧啶基、嗒嗪

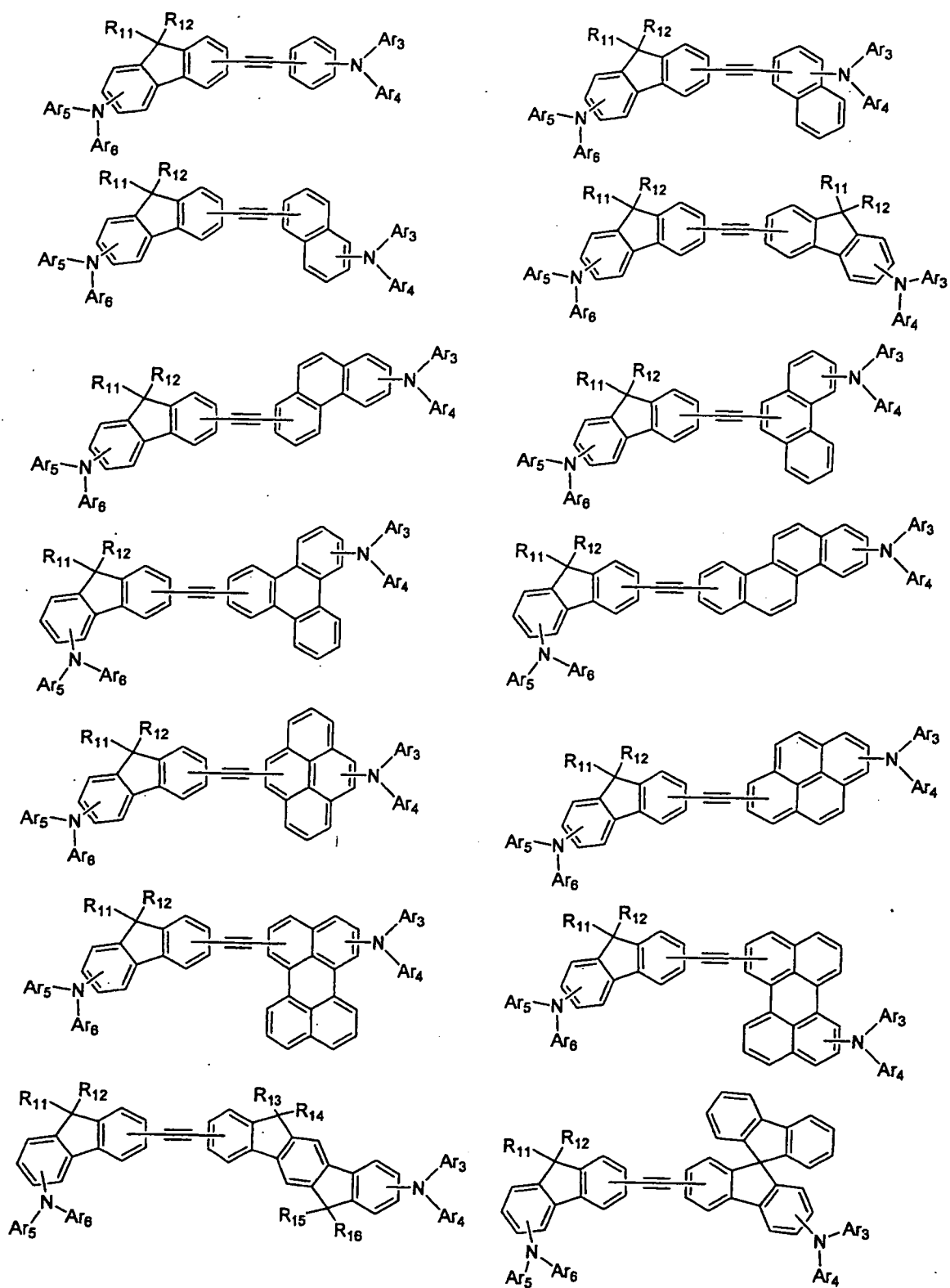
基、喹啉基、三吡基、苯并呋喃基、苯并噻吩基、吡啶基、吡咯基、呋喃基、噻吩基、噁吩基、苯并噻吩基、苯并噁吩基、N-嗎啉基或硫代 N-嗎啉基可進一步經一個或多個選自下列所組成群組之取代基取代：氫、甲基、乙基、正丙基、異丙基、正丁基、異丁基、第三丁基、正戊基、異戊基、正己基、正庚基、正辛基、2-乙基己基、正壬基、癸基、十二烷基、十六烷基、三氟甲基、全氟乙基、三氟乙基、全氟丙基、全氟丁基、甲氧基、乙氧基、丁氧基、己氧基、環戊基、環己基、環庚基、環辛基、氟、氯基、三甲基矽烷基、三乙基矽烷基、三丙基矽烷基、三(第三丁基)矽烷基、第三丁基二甲基矽烷基、二甲基苯基矽烷基、三苯基矽烷基、苯基、聯苯基、9,9-二甲基芐基、9,9-二苯基芐基、萘基、菲基及蒽基。

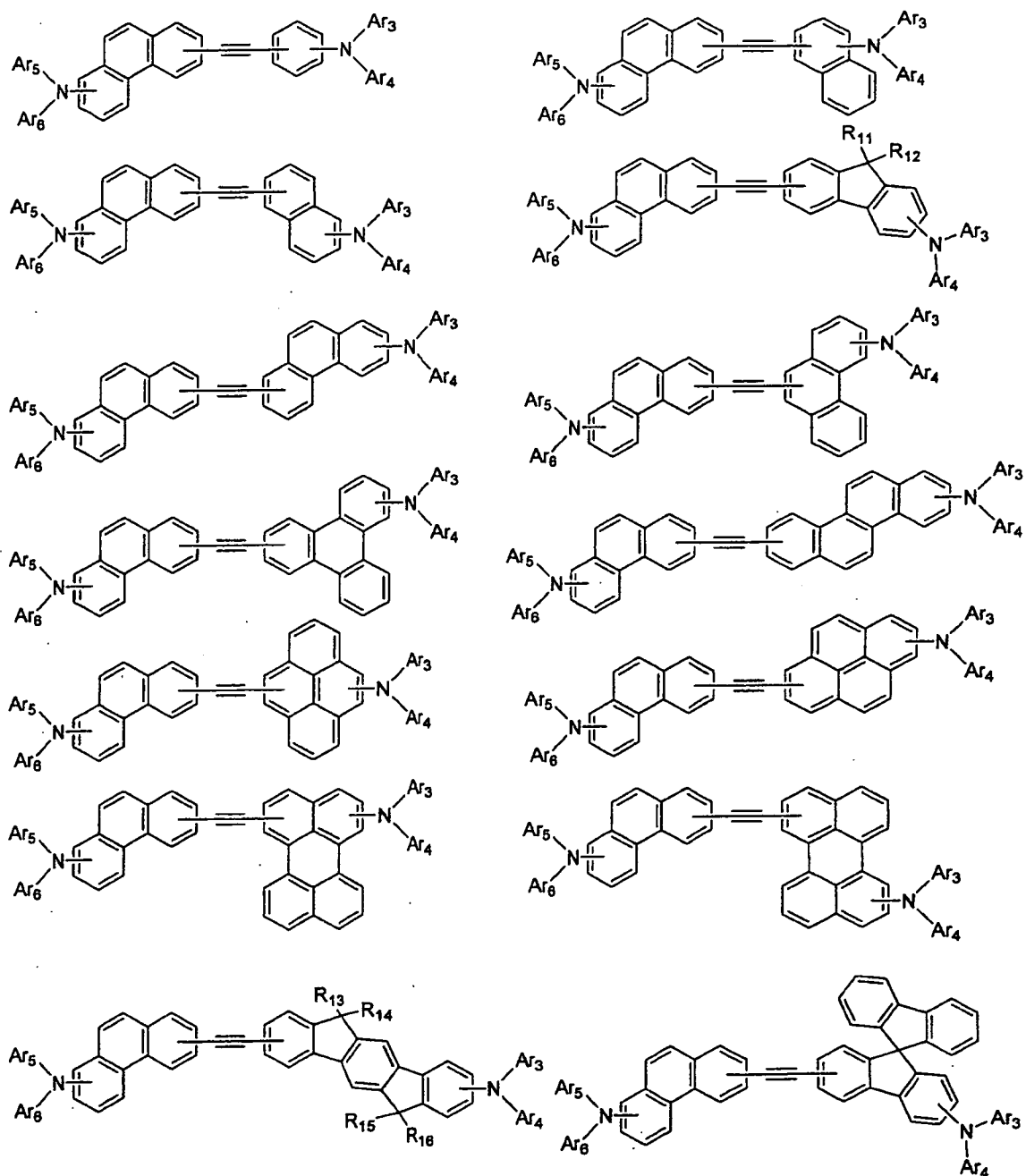
化學式(1)之萘基可為 1-萘基或 2-萘基；蒽基可為 1-蒽基、2-蒽基或 9-蒽基；且芐基可為 1-芐基、2-芐基、3-芐基、4-芐基或 9-芐基。

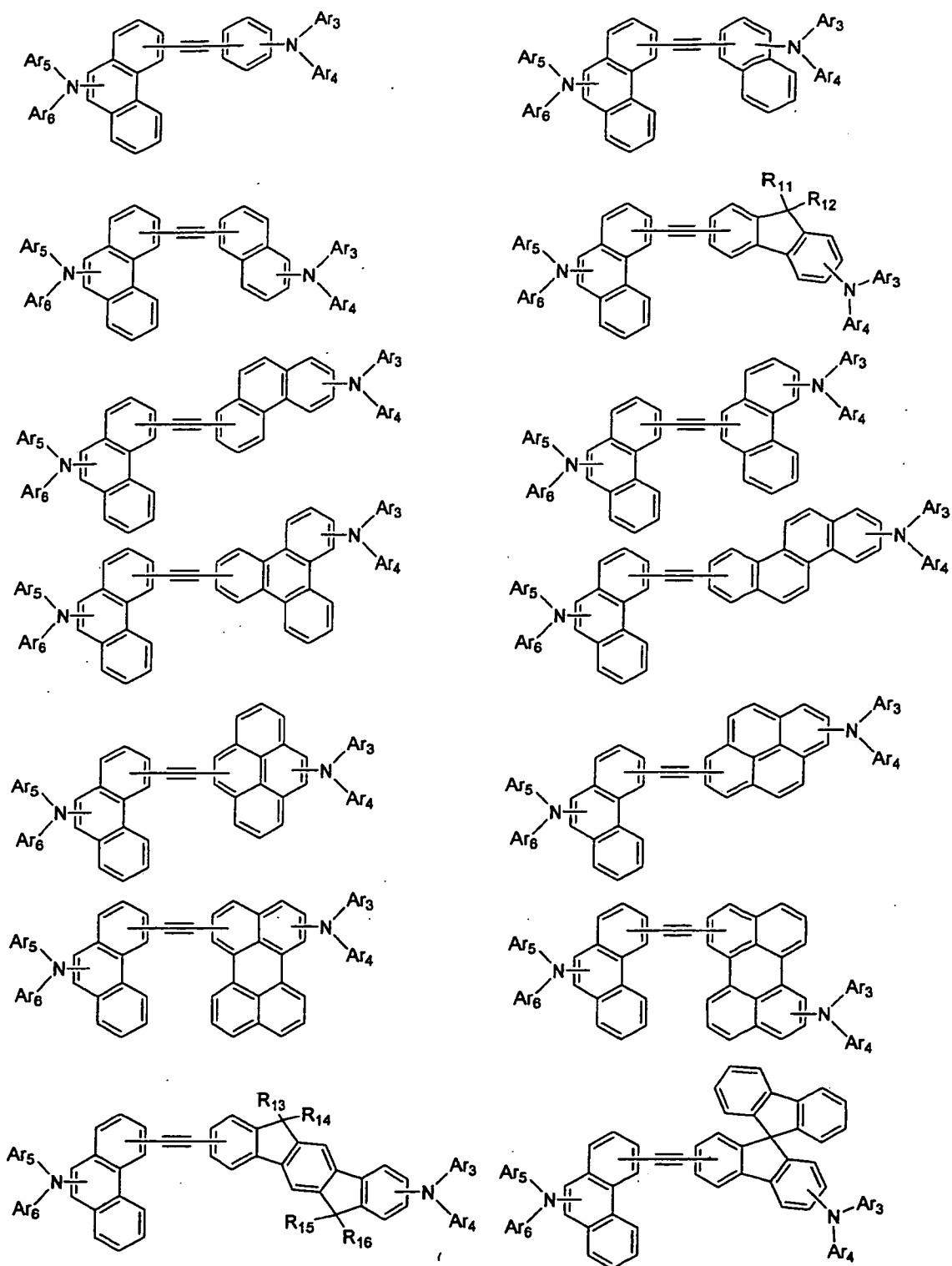
根據本發明之有機電致發光化合物可以下列化合物例示，但不限於下列化合物：

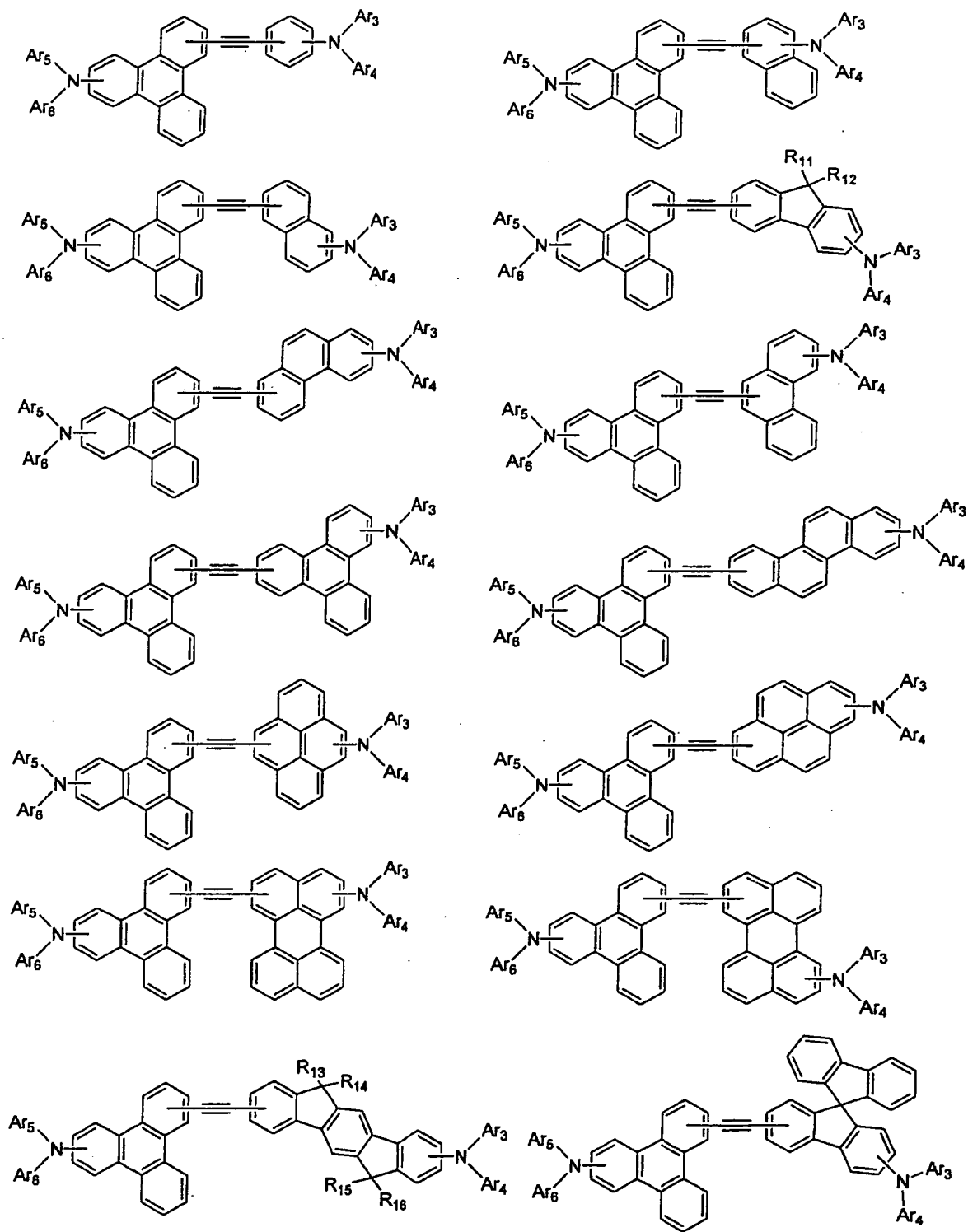


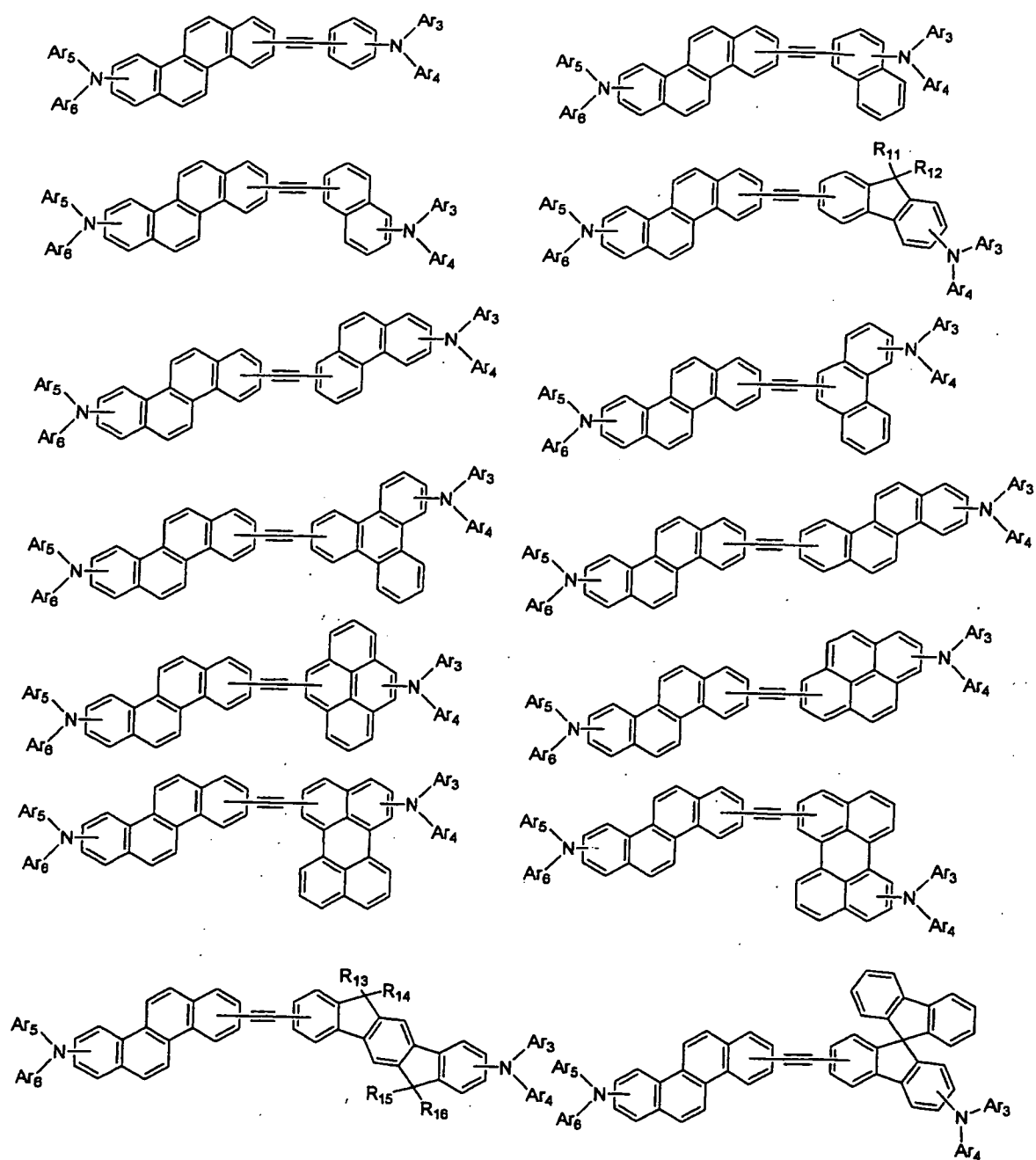


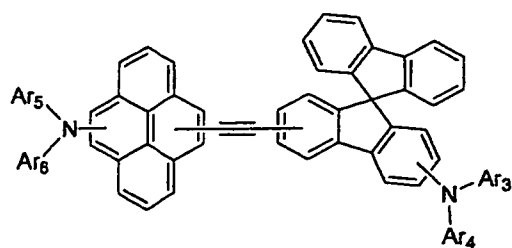
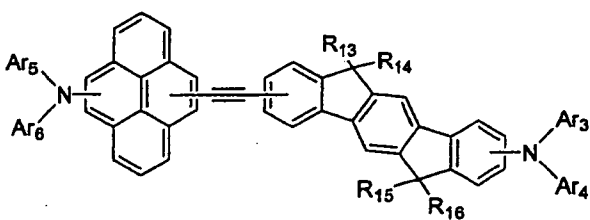
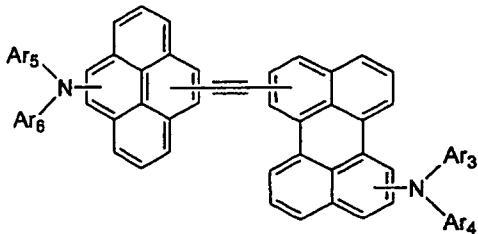
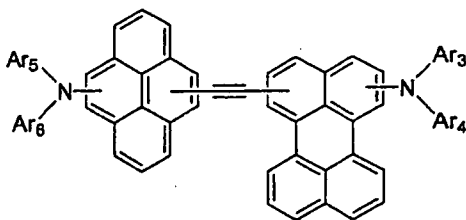
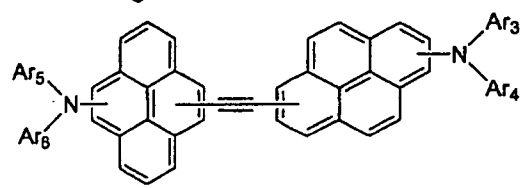
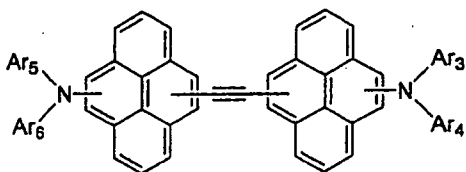
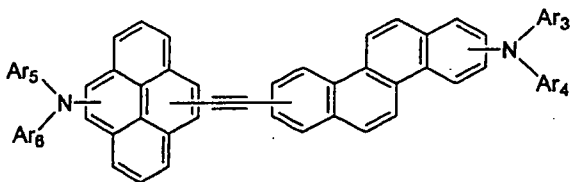
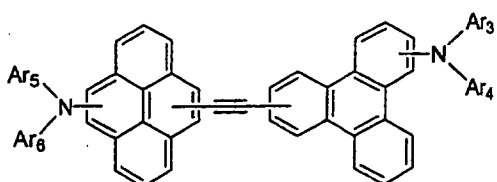
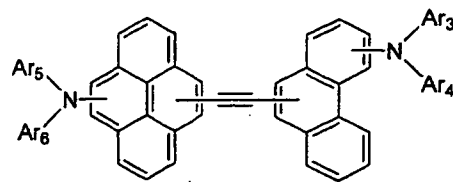
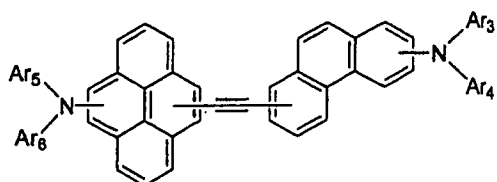
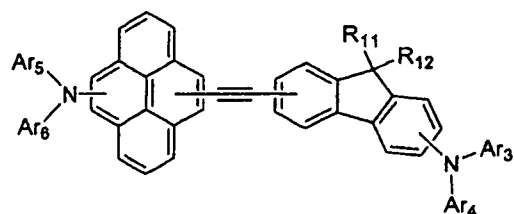
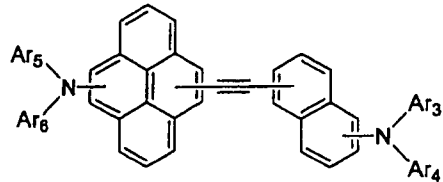
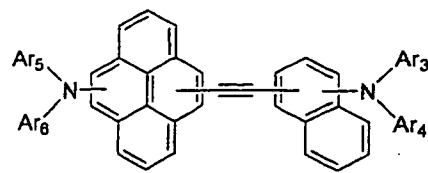
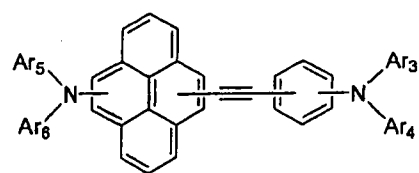


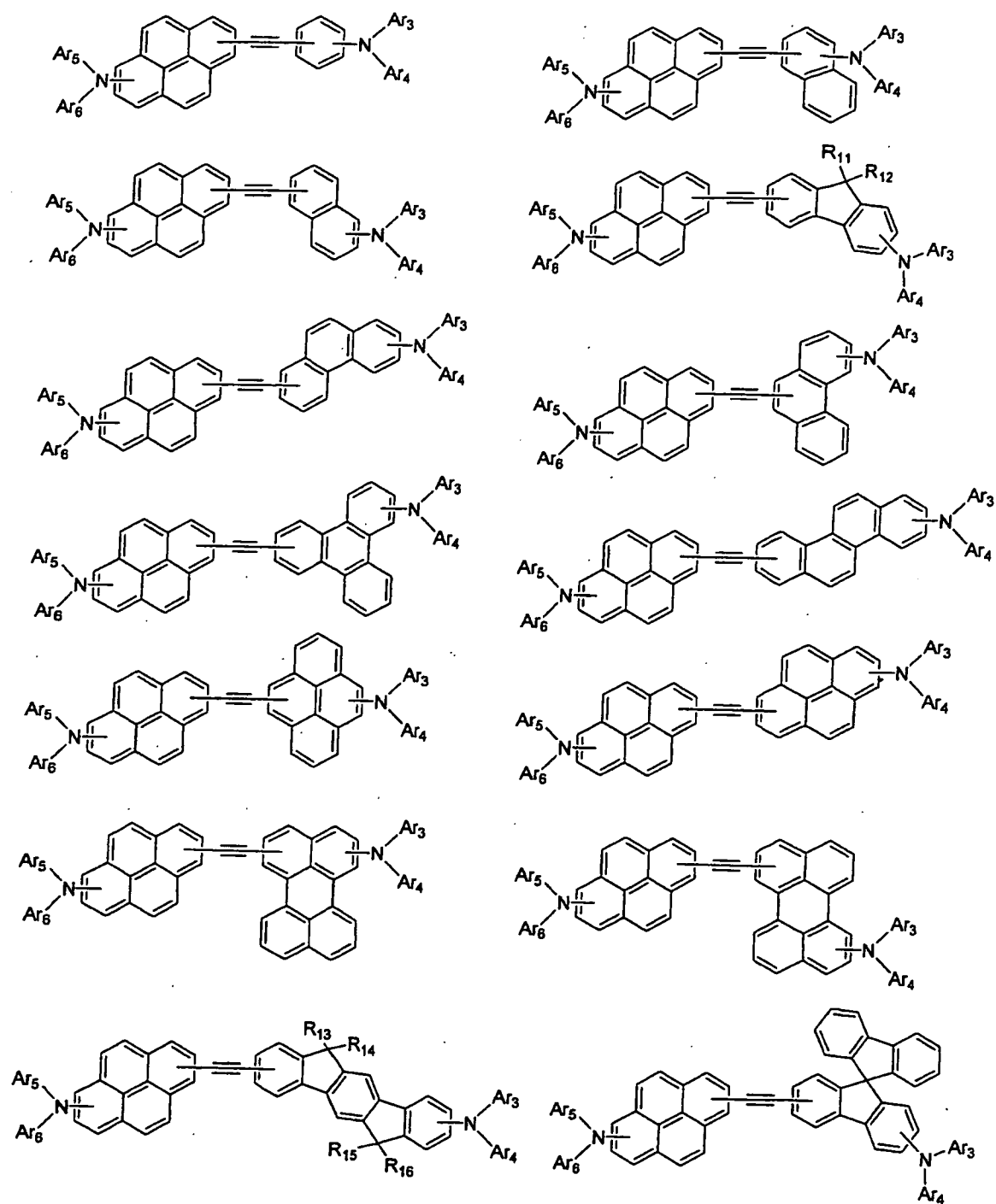


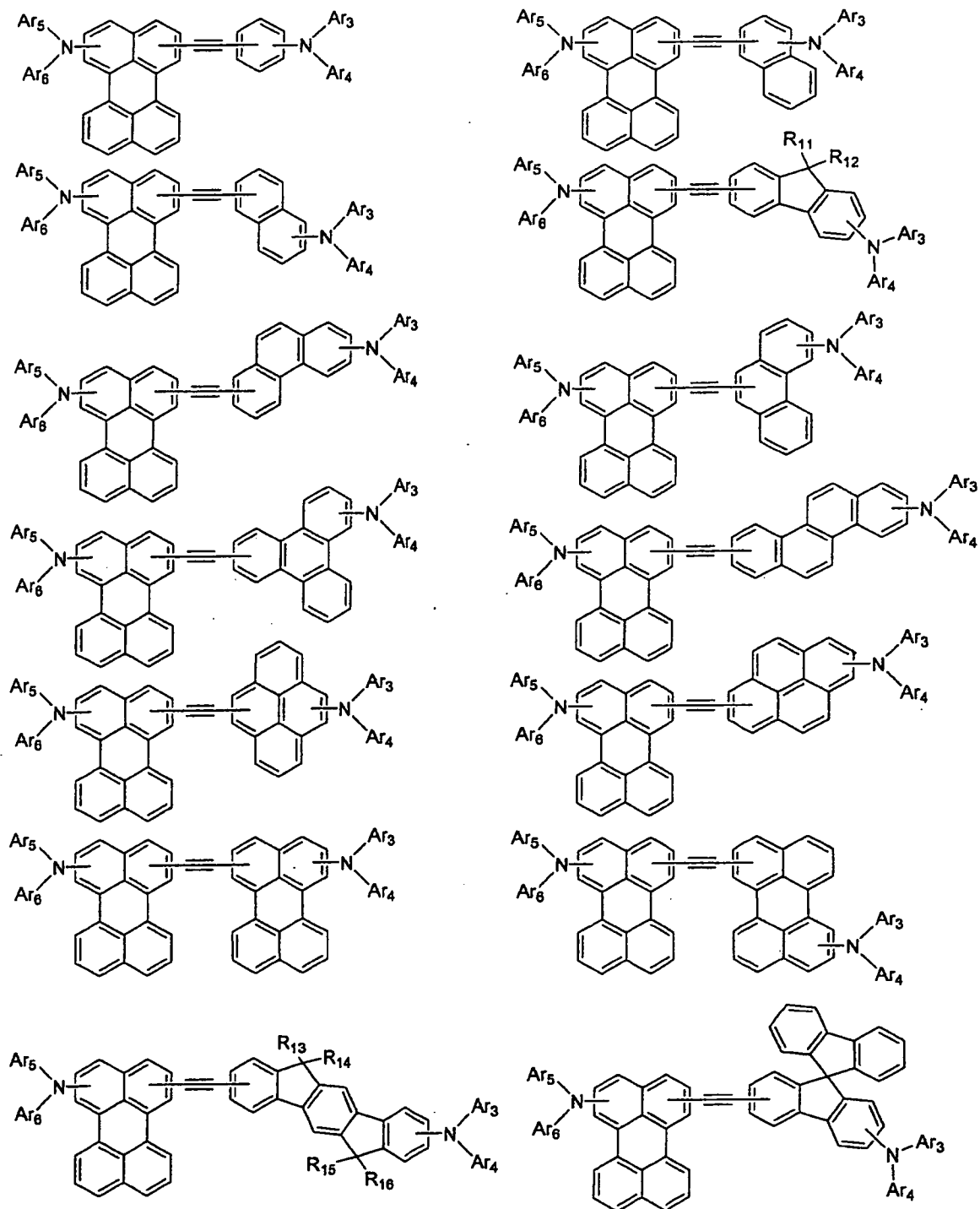


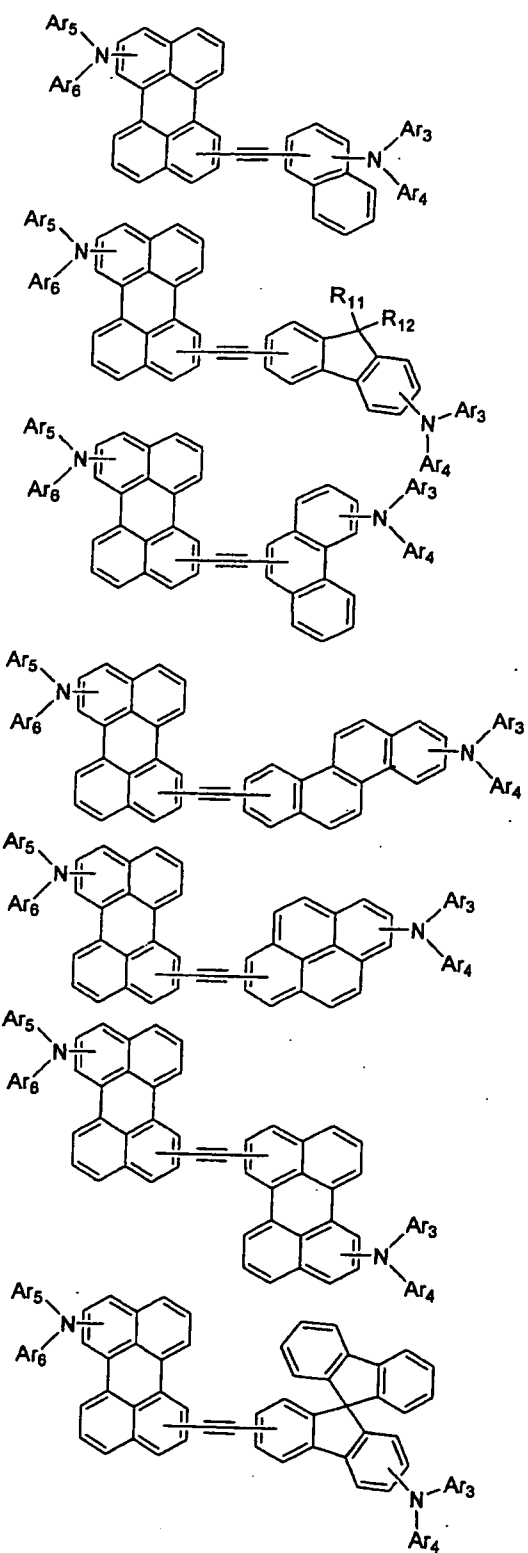
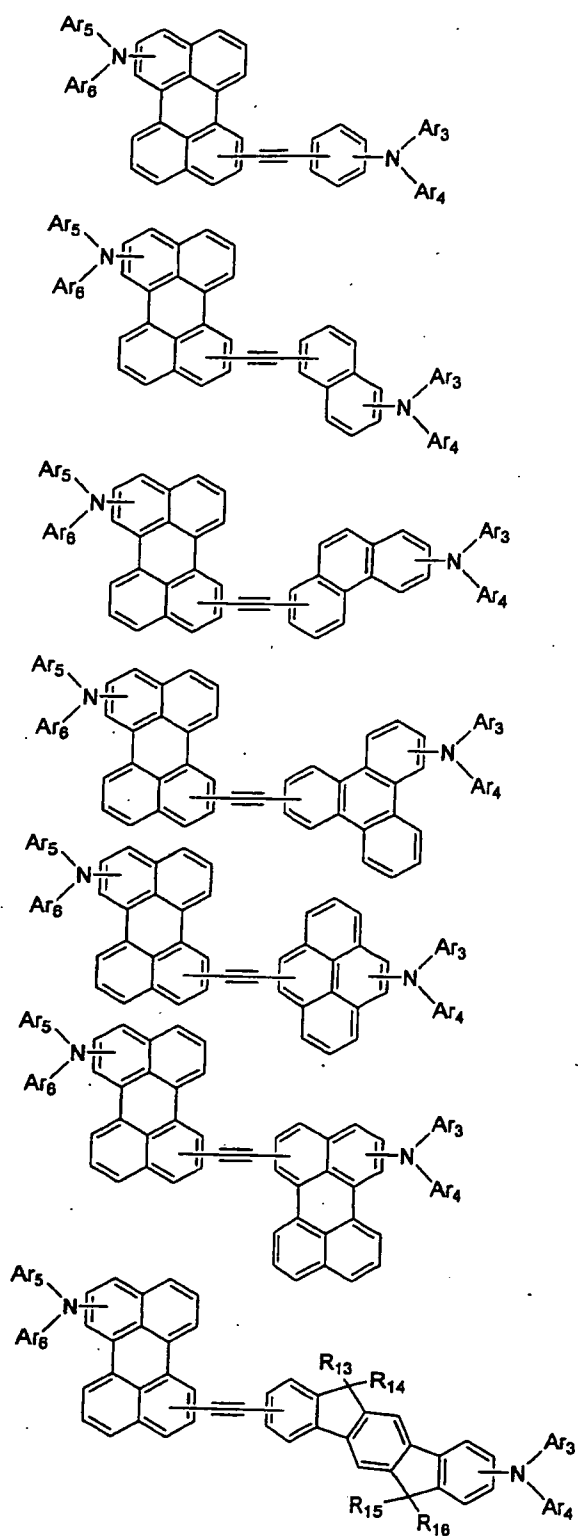


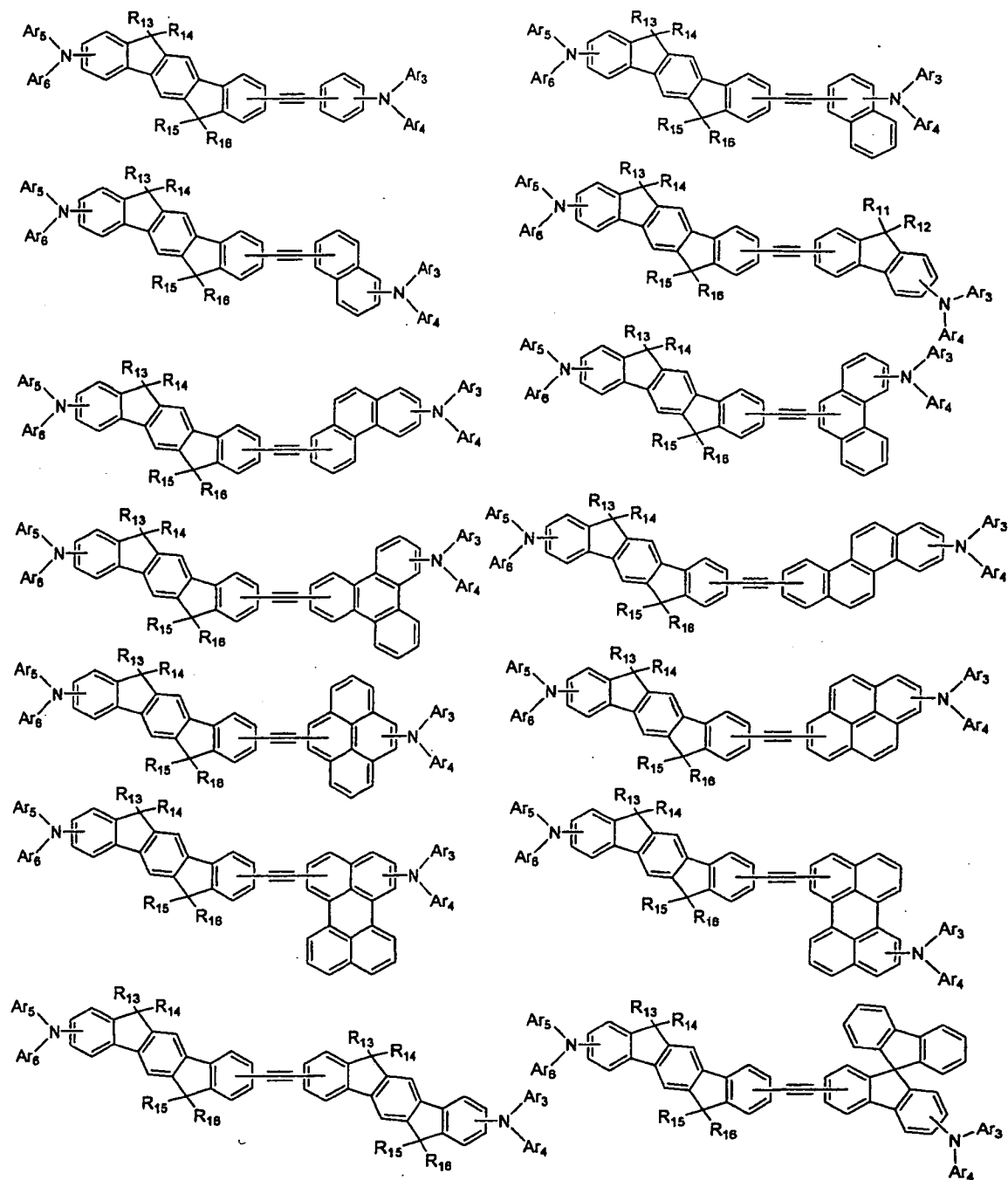


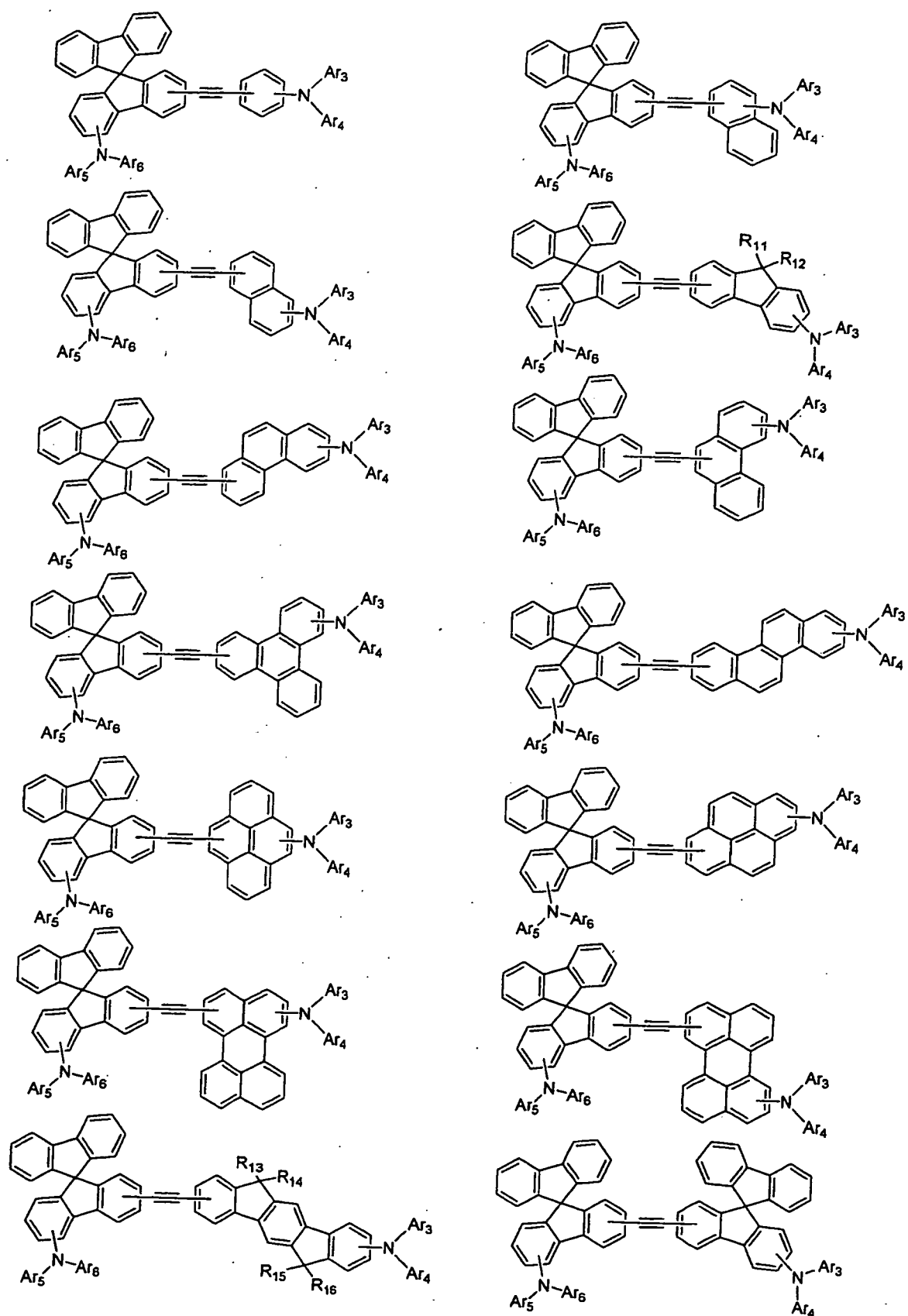


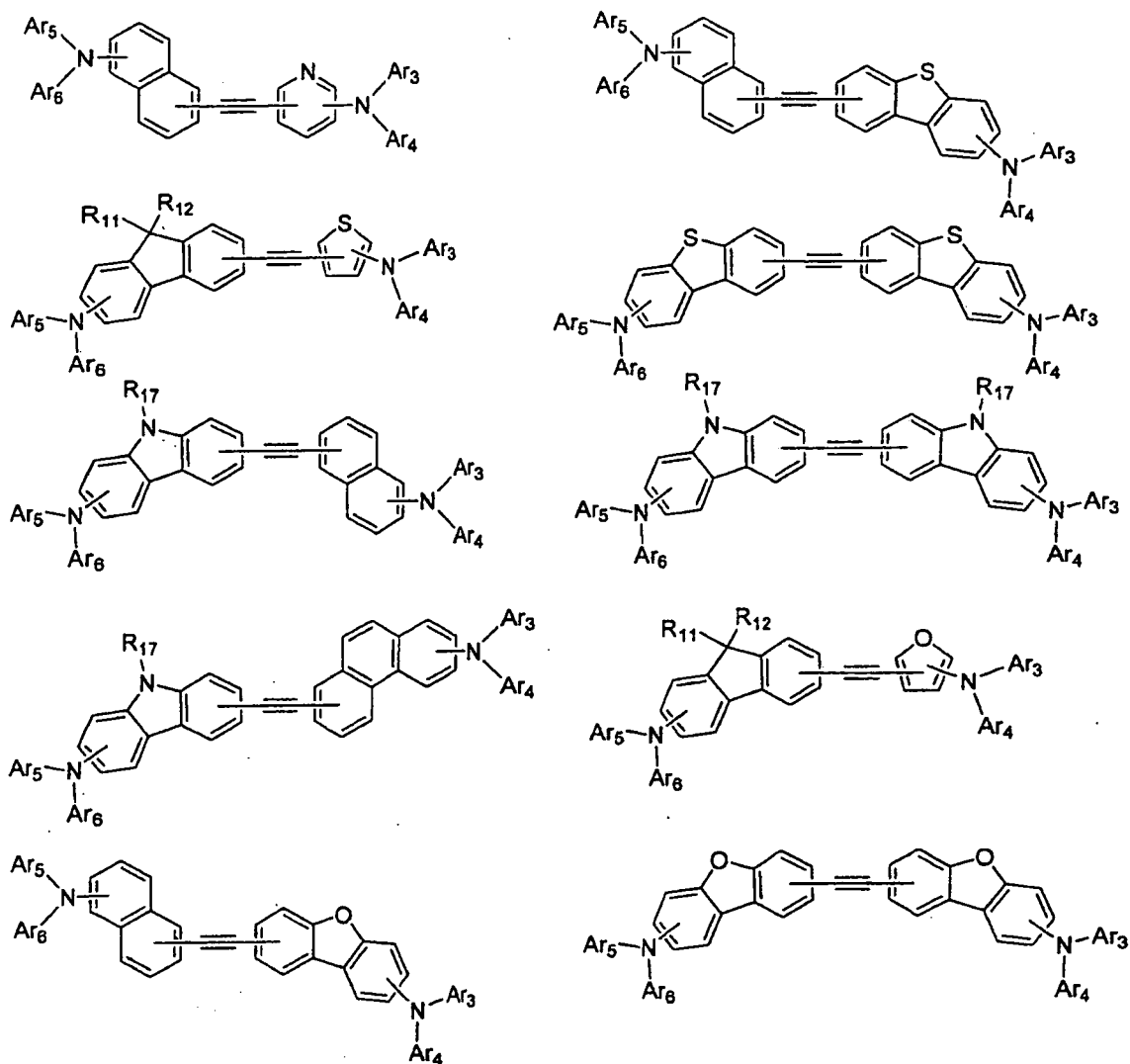












其中，Ar₃至Ar₆係獨立表示苯基、萘基、蒽基、蔥基、菲基、芘基、芘基(perylene)、丙二烯合蒽基、吡啶基、吡咯基、呋喃基、噻吩基、咪唑基、苯并咪唑基、吡嗪基、嘧啶基、嗒嗪基、喹啉基、三嗪基、苯并呋喃基、苯并噻吩基、吡唑基、引哚基、呋唑基、噻唑基、噁唑基、苯并噻唑基、苯并噁唑基、N-嗎啉基或硫代N-嗎啉基；

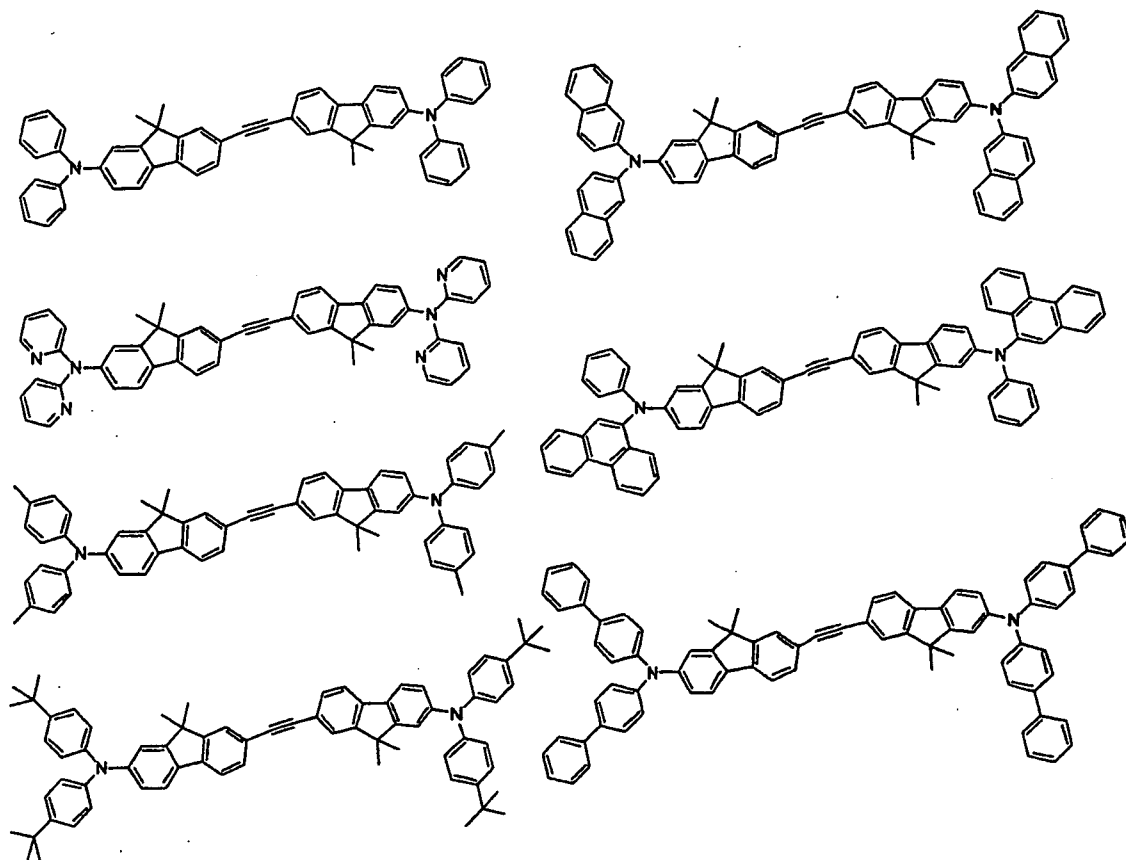
Ar₃至Ar₆之苯基、萘基、蒽基、蔥基、菲基、芘基、芘基(perylene)、丙二烯合蒽基、吡啶基、吡咯基、呋喃基、噻吩基、咪唑基、苯并咪唑基、吡嗪基、嘧啶基、嗒嗪基、喹啉基、三嗪基、苯并呋喃基、苯并噻吩基、吡唑

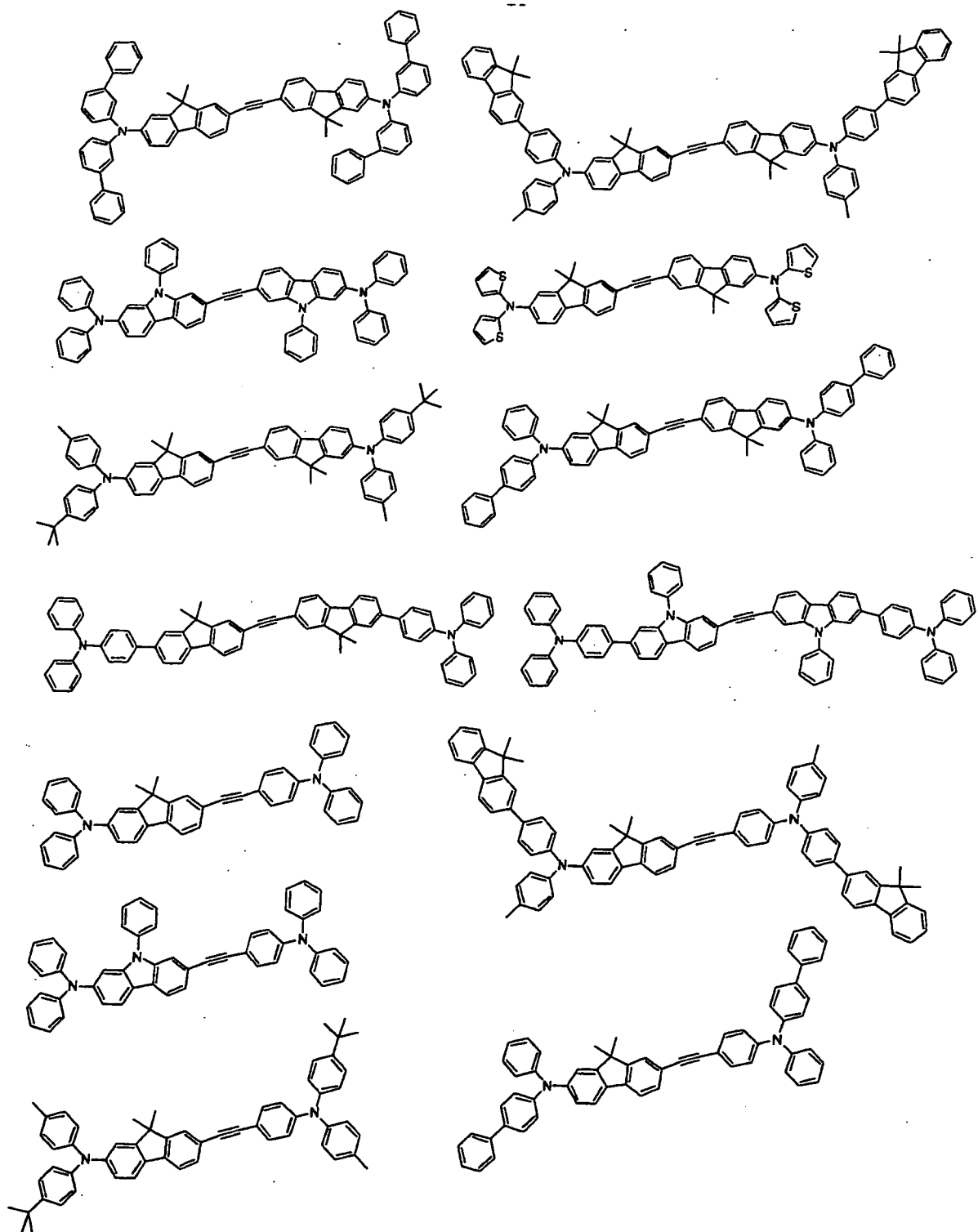
基、吡啶基、呋喃基、噻吩基、噁吩基、苯并噻吩基、苯并噁吩基、N-嗎啉基或硫代 N-嗎啉基可進一步經一個或多個選自下列所組成群組之取代基取代：氫、甲基、乙基、正丙基、異丙基、正丁基、異丁基、第三丁基、正戊基、異戊基、正己基、正庚基、正辛基、2-乙基己基、正壬基、癸基、十二烷基、十六烷基、三氟甲基、全氟乙基、三氟乙基、全氟丙基、全氟丁基、甲氧基、乙氧基、丁氧基、己氧基、環戊基、環己基、環庚基、環辛基、氟、氯基、三甲基矽烷基、三乙基矽烷基、三丙基矽烷基、三(第三丁基)矽烷基、第三丁基二甲基矽烷基、二甲基苯基矽烷基、三苯基矽烷基、苯基、聯苯基、9,9-二甲基芐基、9,9-二苯基芐基、萘基、菲基及蒽基；

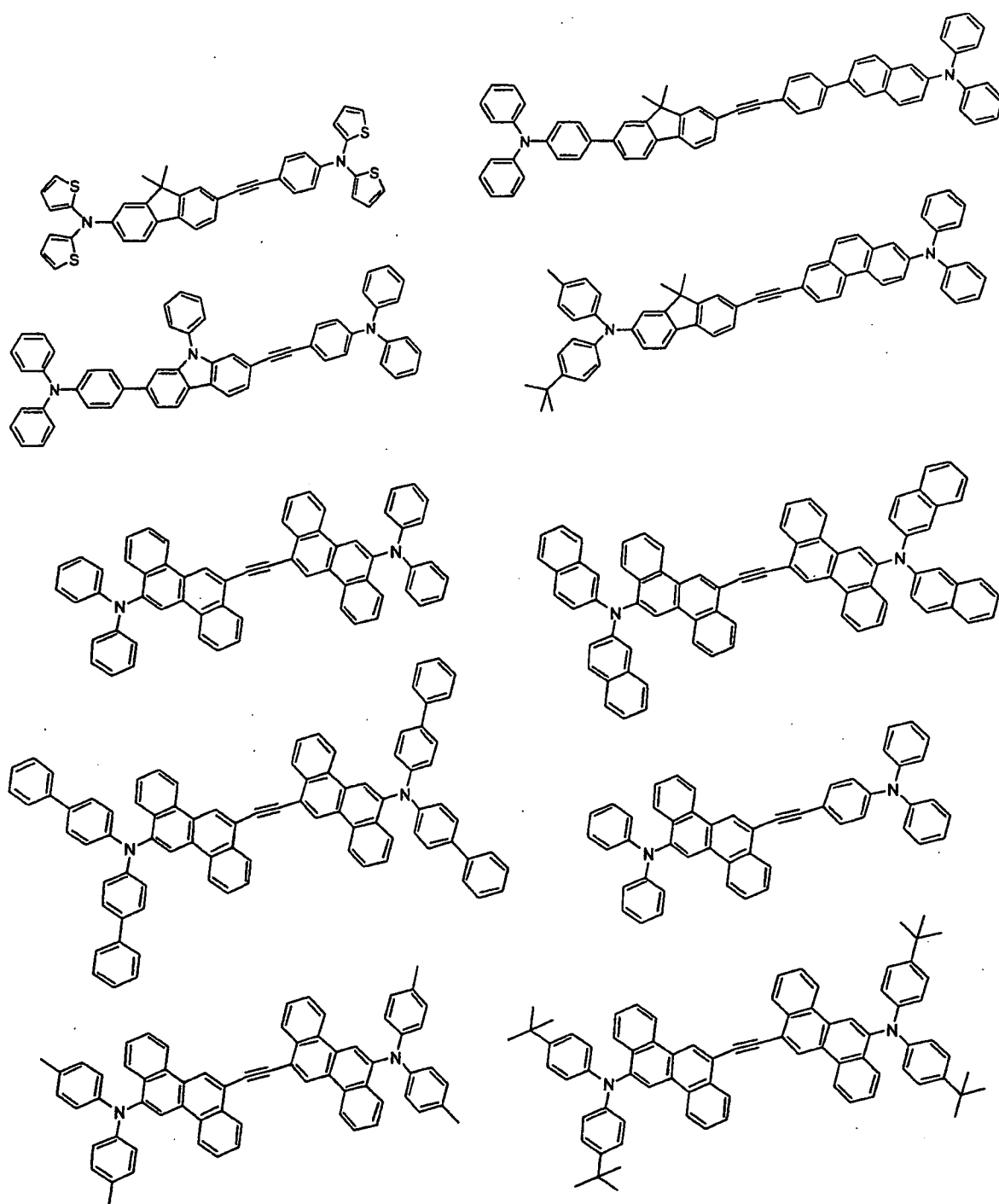
R_{11} 至 R_{16} 係獨立地表示氫、氫、甲基、乙基、正丙基、異丙基、正丁基、異丁基、第三丁基、正戊基、異戊基、正己基、正庚基、正辛基、2-乙基己基、正壬基、癸基、十二烷基、十六烷基、苯基、萘基、聯苯基、芐基、菲基、蒽基、丙二烯合芐基、聯伸三苯基、芘基、蒽基、稠四苯基或芘基；以及

R_{11} 至 R_{16} 之苯基、萘基、聯苯基、芐基、菲基、蒽基、丙二烯合芐基、聯伸三苯基、芘基、蒽基、稠四苯基或芘基可進一步經一個或多個選自氫、甲基、乙基、正丙基、異丙基、正丁基、異丁基、第三丁基、正戊基、異戊基、正己基、正庚基、正辛基、2-乙基己基、正壬基、癸基、十二烷基及十六烷基之取代基取代。

更具體的，根據本發明之有機電致發光化合物可由下列化合物例示，但不限於下列化合物。

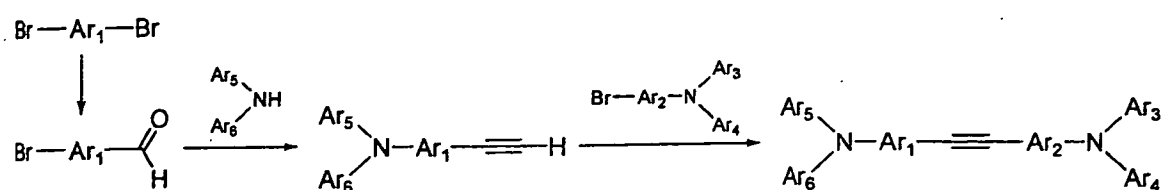






根據本發明之有機電致發光化合物可根據反應圖(1)
所說明之程序製備：

反應圖(1)



其中， Ar_1 、 Ar_2 、 Ar_3 、 Ar_4 、 Ar_5 及 Ar_6 係如在化學式(1)中所定義者。

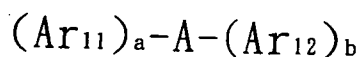
此外，本發明提供有機太陽能電池，其係包括一種或多種如化學式(1)所示之有機電致發光化合物。

本發明復提供有機電致發光裝置，其係包括第一電極；第二電極；以及至少一個插置於第一電極與第二電極間之有機層；其中有機層包括一種或多種如化學式(1)所示之有機電致發光化合物。

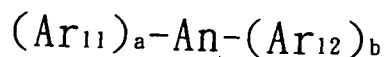
根據本發明之有機電致發光裝置的特徵在於有機層包括電致發光區，並且該區包括一種或多種如化學式(1)所示之化合物作為電致發光摻雜物以及一種或多種主體材料。

施用於根據本發明之電致發光裝置之主體材料並無特別限制，但較佳係選自化學式(2)或化學式(3)所示之化合物：

化學式(2)



化學式(3)



其中，

Ar_{11} 與 Ar_{12} 係獨立地選自氫、(C1-C60)烷基、(C1-C60)烷氧基、鹵素、(C4-C60)雜芳基、(C5-C60)環烷基及(C6-C60)芳基；並且 Ar_{11} 與 Ar_{12} 之環烷基、芳基或雜芳基可進一步經一個或多個選自下列所組成群組之取代基取代：含有或

不含有一個或多個選自由氬、含有或不含有鹵素取代基之(C6-C60)芳基或(C1-C60)烷基、(C1-C60)烷氧基、(C3-C60)環烷基、鹵素、氰基、三(C1-C60)烷基矽烷基、二(C1-C60)烷基(C6-C60)芳基矽烷基及三(C6-C60)芳基矽烷基所組成之群組之取代基之(C6-C60)芳基或(C4-C60)雜芳基；含有或不含有鹵素取代基之(C1-C60)烷基；(C1-C60)烷氧基；(C3-C60)環烷基；鹵素、氰基、三(C1-C60)烷基矽烷基；二(C1-C60)烷基(C6-C60)芳基矽烷基及三(C6-C60)芳基矽烷基；

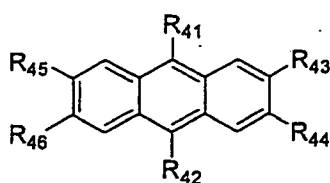
A 表示(C6-C60)伸芳基或(C4-C60)雜伸芳基；

a 與 b 係獨立地表示 0 至 4 之整數；以及

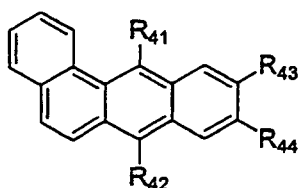
An 包括含有或不含有取代基之蔥骨架。

化學式(2)或化學式(3)所示之主體材料可由化學式(4)至化學式(7)之一所示之蔥衍生物或苯并[a]蔥衍生物例示。

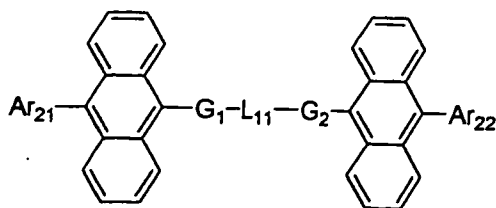
化學式(4)



化學式(5)



化學式(6)



於化學式(4)至化學式(6)中，

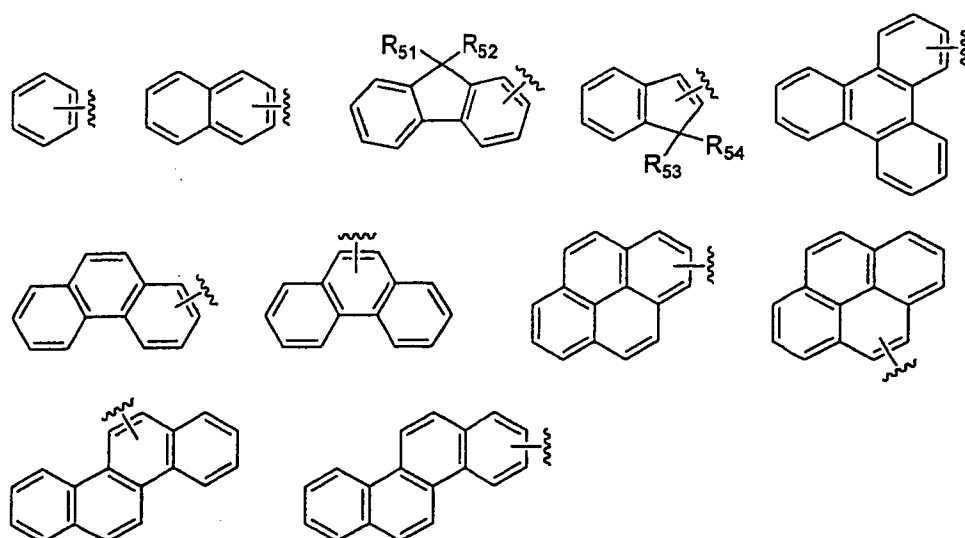
R_{41} 與 R_{42} 係獨立地表示(C6-C60)芳基、(C4-C60)雜芳基、含有一個或多個選自 N、O 及 S 之雜原子之 5 員或 6 員雜環烷基或(C3-C60)環烷基，並且 R_{41} 與 R_{42} 之芳基或雜芳基可進一步經一個或多個選自下列所組成群組之取代基取代：(C1-C60)烷基、鹵(C1-C60)烷基、(C1-C60)烷氧基、(C3-C60)環烷基、(C6-C60)芳基、(C4-C60)雜芳基、鹵素、氰基、三(C1-C60)烷基矽烷基、二(C1-C60)烷基(C6-C60)芳基矽烷基及三(C6-C60)芳基矽烷基；

R_{43} 至 R_{46} 係獨立地表示氫、(C1-C60)烷基、(C1-C60)烷氧基、鹵素、(C4-C60)雜芳基、(C5-C60)環烷基或(C6-C60)芳基，且 R_{43} 至 R_{46} 之雜芳基、環烷基或芳基可進一步經一個或多個選自下列所組成群組之取代基取代：含有或不含有鹵素取代基之(C1-C60)烷基、(C1-C60)烷氧基、(C3-C60)環烷基、鹵素、氰基、三(C1-C60)烷基矽烷基、二(C1-C60)烷基(C6-C60)芳基矽烷基及三(C6-C60)芳基矽烷基；

G_1 及 G_2 係獨立地表示化學鍵或含有或不含有一個或多個選自(C1-C60)烷基、(C1-C60)烷氧基、(C6-C60)芳基、(C4-C60)雜芳基及鹵素之取代基之(C6-C60)伸芳基；

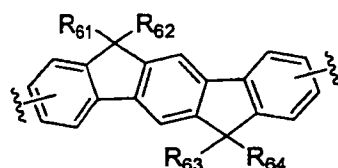
Ar_{21} 與 Ar_{22} 表示(C4-C60)雜芳基或選自下列結構之芳

基：



Ar₂₁ 與 Ar₂₂ 之芳基或雜芳基可經一個或多個選自 (C1-C60) 烷基、(C1-C60) 烷氧基、(C6-C60) 芳基及 (C4-C60) 雜芳基之取代基取代；

L₁₁ 表示 (C6-C60) 伸芳基、(C4-C60) 雜伸芳基或下列結構式所示之化合物：



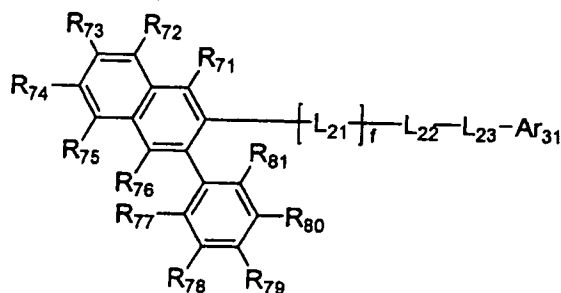
L₁₁ 之伸芳基或雜伸芳基可經一個或多個選自 (C1-C60) 烷基、(C1-C60) 烷氧基、(C6-C60) 芳基、(C4-C60) 雜芳基及鹵素之取代基取代；

R₅₁ 至 R₅₄ 係獨立表示氫、(C1-C60) 烷基或 (C6-C60) 芳基，或者 R₅₁ 至 R₅₄ 可個別經由含有或不含有稠合環之 (C3-C60) 伸烷基或 (C3-C60) 伸烯基與相鄰取代基鍵聯以形成脂環、或單環或多環之芳香環；

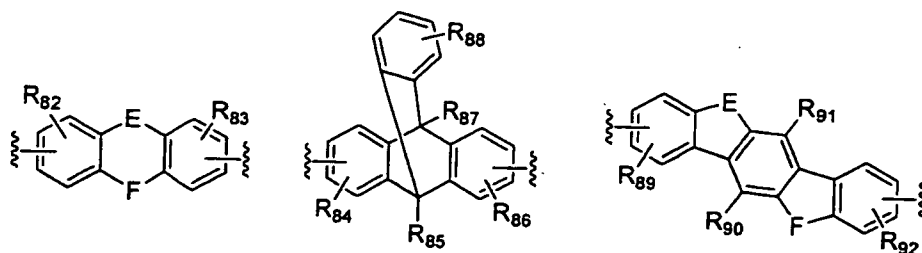
R₆₁ 至 R₆₄ 係獨立地表示氫、(C1-C60) 烷基、(C1-C60)

烷氧基、(C6-C60)芳基、(C4-C60)雜芳基或鹵素，或者 R_{61} 至 R_{64} 可個別經由含有或不含有稠合環之(C3-C60)伸烷基或(C3-C60)伸烯基與相鄰取代基鍵聯以形成脂環、或單環或多環之芳香環。

化學式(7)



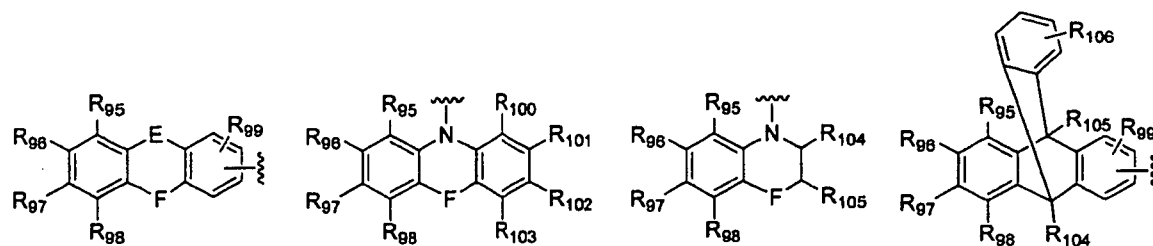
於化學式(7)中， L_{21} 表示(C6-C60)伸芳基、含有一個或多個選自 N、O 及 S 之雜原子之(C3-C60)雜伸芳基、或選自下列結構式所示之二價基團：



L_{22} 與 L_{23} 係獨立地表示化學鍵、(C1-C60)伸烷基氧基、(C1-C60)伸烷基硫基、(C6-C60)伸芳基氧基、(C6-C60)伸芳基硫基、(C6-C60)伸芳基或含有一個或多個選自 N、O 及 S 之雜原子之(C3-C60)雜伸芳基；

Ar_{31} 表示 $NR_{93}R_{94}$ 、(C6-C60)芳基、含有一個或多個選自 N、O 及 S 之雜原子之(C3-C60)雜芳基、含有一個或多個選自 N、O 及 S 之雜原子之 5 員或 6 員雜環烷基、(C3-C60)

環烷基、金剛烷基、(C7-C60)雙環烷基或選自下列結構之取代基：



其中， R_{71} 至 R_{81} 係獨立地表示氫、氖、鹵素、(C1-C60)烷基、(C6-C60)芳基、含有一個或多個選自 N、O 及 S 之雜原子之 (C3-C60)雜芳基、N-嗎啉基、硫代 N-嗎啉基、含有一個或多個選自 N、O 及 S 之雜原子之 5 員或 6 員雜環烷基、(C3-C60)環烷基、三(C1-C60)烷基矽烷基、二(C1-C60)烷基(C6-C60)芳基矽烷基、三(C6-C60)芳基矽烷基、金剛烷基、(C7-C60)雙環烷基、(C2-C60)烯基、(C2-C60)炔基、氰基、(C1-C60)烷基胺基、(C6-C60)芳基胺基、(C6-C60)芳基(C1-C60)烷基、(C1-C60)烷氧基、(C1-C60)烷基硫基、(C6-C60)芳氧基、(C6-C60)芳基硫基、(C1-C60)烷氧基羰基、(C1-C60)烷基羰基、(C6-C60)芳基羰基、羧基、硝基或羥基，或 R_{71} 至 R_{81} 可個別經由含有或不含有稠合環之 (C3-C60)伸烷基或 (C3-C60)伸烯基與相鄰取代基鍵聯以形成脂環、或單環或多環之芳香環；

R_{82} 至 R_{92} 係獨立地表示氫、氖、鹵素、(C1-C60)烷基、(C6-C60)芳基、含有一個或多個選自 N、O 及 S 之雜原子之 (C3-C60)雜芳基、N-嗎啉基、硫代 N-嗎啉基、含有一個或多個選自 N、O 及 S 之雜原子之 5 員或 6 員雜環烷基、(C3-C60)

環烷基、三(C1-C60)烷基矽烷基、二(C1-C60)烷基(C6-C60)芳基矽烷基、三(C6-C60)芳基矽烷基、金剛烷基、(C7-C60)雙環烷基、(C2-C60)烯基、(C2-C60)炔基、氰基、(C1-C60)烷基胺基、(C6-C60)芳基胺基、(C6-C60)芳基(C1-C60)烷基、(C1-C60)烷氧基、(C1-C60)烷基硫基、(C6-C60)芳氧基、(C6-C60)芳基硫基、(C1-C60)烷氧基羰基、(C1-C60)烷基羰基、(C6-C60)芳基羰基、羧基、硝基或羥基，或 R_{82} 至 R_{92} 可個別經由含有或不含有稠合環之(C3-C60)伸烷基或(C3-C60)伸烯基與相鄰取代基鍵聯以形成脂環、或單環或多環之芳香環；

R_{93} 與 R_{94} 係獨立地表示氫、氘、鹵素、(C1-C60)烷基、(C6-C60)芳基、含有一個或多個選自 N、O 及 S 之雜原子之(C3-C60)雜芳基、N-嗎啉基、硫代 N-嗎啉基、含有一個或多個選自 N、O 及 S 之雜原子之 5 員或 6 員雜環烷基、(C3-C60)環烷基、三(C1-C60)烷基矽烷基、二(C1-C60)烷基(C6-C60)芳基矽烷基、三(C6-C60)芳基矽烷基、金剛烷基、(C7-C60)雙環烷基、(C2-C60)烯基、(C2-C60)炔基、氰基、(C1-C60)烷基胺基、(C6-C60)芳基胺基、(C6-C60)芳基(C1-C60)烷基、(C1-C60)烷氧基、(C1-C60)烷基硫基、(C6-C60)芳氧基、(C6-C60)芳基硫基、(C1-C60)烷氧基羰基、(C1-C60)烷基羰基、(C6-C60)芳基羰基、羧基、硝基或羥基，或 R_{93} 與 R_{94} 可經由含有或不含有稠合環之(C3-C60)伸烷基或(C3-C60)伸烯基相鍵聯以形成脂環、或單環或多環之芳香環；

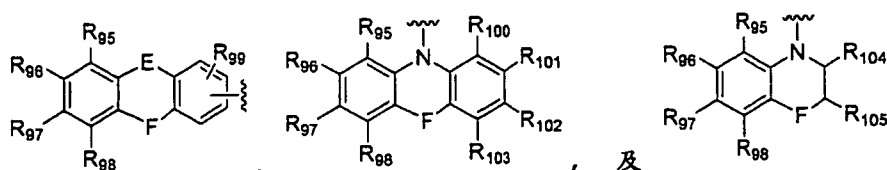
R_{95} 至 R_{106} 係獨立地表示氫、氖、鹵素、(C1-C60)烷基、(C6-C60)芳基、含有一個或多個選自 N、O 及 S 之雜原子之 (C3-C60)雜芳基、N-嗎啉基、硫代 N-嗎啉基、含有一個或多個選自 N、O 及 S 之雜原子之 5 員或 6 員雜環烷基、(C3-C60)環烷基、三(C1-C60)烷基矽烷基、二(C1-C60)烷基(C6-C60)芳基矽烷基、三(C6-C60)芳基矽烷基、金剛烷基、(C7-C60)雙環烷基、(C2-C60)烯基、(C2-C60)炔基、氰基、(C1-C60)烷基胺基、(C6-C60)芳基胺基、(C6-C60)芳基(C1-C60)烷基、(C1-C60)烷氧基、(C1-C60)烷基硫基、(C6-C60)芳氧基、(C6-C60)芳基硫基、(C1-C60)烷氧基羰基、(C1-C60)烷基羰基、(C6-C60)芳基羰基、羧基、硝基或羥基，或 R_{95} 至 R_{106} 可個別經由含有或不含有稠合環之(C3-C60)伸烷基或(C3-C60)伸烯基與相鄰取代基鍵聯以形成脂環、或單環或多環之芳香環；

E 與 F 係獨立地表示化學鍵、 $-(CR_{107}R_{108})g-$ 、 $-N(R_{109})-$ 、 $-S-$ 、 $-O-$ 、 $-Si(R_{110})(R_{111})-$ 、 $-P(R_{112})-$ 、 $-C(=O)-$ 、 $-B(R_{113})-$ 、 $-In(R_{114})-$ 、 $-Se-$ 、 $-Ge(R_{115})(R_{116})-$ 、 $-Sn(R_{117})(R_{118})-$ 、 $-Ga(R_{119})-$ 或 $-(R_{120})C=C(R_{121})-$ ；

R_{107} 至 R_{121} 係獨立地表示氫、氖、鹵素、(C1-C60)烷基、(C6-C60)芳基、含有一個或多個選自 N、O 及 S 之雜原子之 (C3-C60)雜芳基、N-嗎啉基、硫代 N-嗎啉基、含有一個或多個選自 N、O 及 S 之雜原子之 5 員或 6 員雜環烷基、(C3-C60)環烷基、三(C1-C60)烷基矽烷基、二(C1-C60)烷基(C6-C60)芳基矽烷基、三(C6-C60)芳基矽烷基、金剛烷基、(C7-C60)

雙環烷基、(C2-C60)烯基、(C2-C60)炔基、氰基、(C1-C60)烷基胺基、(C6-C60)芳基胺基、(C6-C60)芳基(C1-C60)烷基、(C1-C60)烷氧基、(C1-C60)烷基硫基、(C6-C60)芳氧基、(C6-C60)芳基硫基、(C1-C60)烷氧基羰基、(C1-C60)烷基羰基、(C6-C60)芳基羰基、羧基、硝基或羥基，或 R_{107} 與 R_{108} 、 R_{110} 與 R_{111} 、 R_{115} 與 R_{116} 、 R_{117} 與 R_{118} 或 R_{120} 與 R_{121} 可經由含有或不含有稠合環之(C3-C60)伸烷基或(C3-C60)伸烯基相鍵聯以形成脂環、或單環或多環之芳香環；

L_{21} 至 L_{23} 之伸芳基或雜伸芳基、 Ar_{31} 之芳基或雜芳基、或 R_{71} 至 R_{121} 之烷基、芳基、雜芳基、雜環烷基、環烷基、三烷基矽烷基、二烷基芳基矽烷基、三芳基矽烷基、烯基、炔基、烷基胺基或芳基胺基可進一步獨立地經一個或多個選自氬、鹵素、(C1-C60)烷基、鹵(C1-C60)烷基、(C6-C60)芳基、含有一個或多個選自 N、O 及 S 之雜原子之(C3-C60)雜芳基(其中(C6-C60)芳基含有或不含有取代基)、N-嗎啉基、硫代 N-嗎啉基、含有一個或多個選自 N、O 及 S 之雜原子之 5 員或 6 員雜環烷基、(C3-C60)環烷基、三(C1-C60)烷基矽烷基、二(C1-C60)烷基(C6-C60)芳基矽烷基、三(C6-C60)芳基矽烷基、金剛烷基、(C7-C60)雙環烷基、(C2-C60)烯基、(C2-C60)炔基、氰基、(C1-C60)烷基胺基、(C6-C60)芳基胺基、(C6-C60)芳基(C1-C60)烷基、(C1-C60)烷氧基、(C1-C60)烷基硫基、(C6-C60)芳氧基、(C6-C60)芳基硫基、(C1-C60)烷氧基羰基、(C1-C60)烷基羰基、(C6-C60)芳基羰基、羧基、硝基、羥基、



之取代基取代；

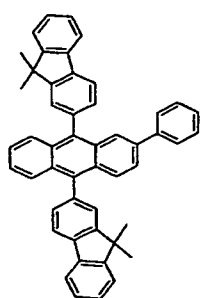
g 係 1 至 4 之整數；以及

f 係 1 至 4 之整數。

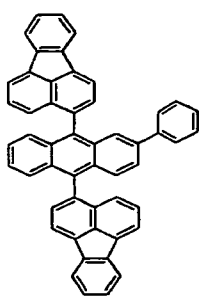
電致發光層意指產生電致發光之層，且其可為單層或由層壓兩層或更多層所組成之多層。當根據本發明之組成使用主體材料-摻雜物之混合物時，可證實因具發明性的電致發光主體材料而使發光效率比僅使用根據本發明之電致發光化合物之裝置的發光效率有顯著改善。此可由摻雜濃度為 0.5 重量%至 10 重量%而實現。與其他習知主體材料相比，根據本發明之主體材料顯示較高之電洞及電子傳導性、及更優異的材料安定性，以及提供改善之裝置壽命與發光效率。

因此，可以說使用化學式(4)至化學式(7)中之一所示之化合物作為電致發光主體材料顯著的彌補根據本發明之化學式(1)之有機電致發光化合物的電子缺陷。

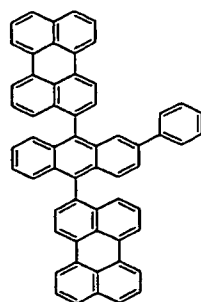
化學式(4)至化學式(7)中之一者所示之主體材料化合物可由下列化合物例示，但不限於下列化合物。



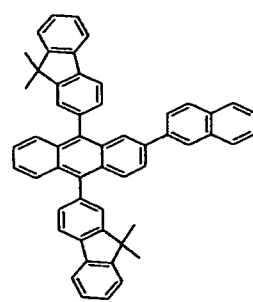
H-1



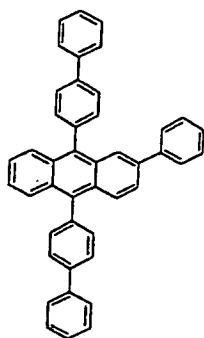
H-2



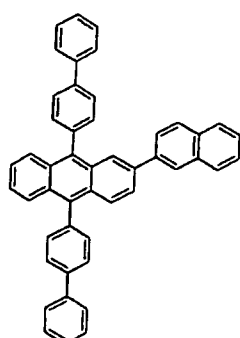
H-3



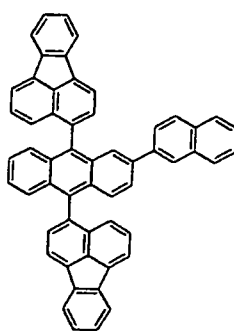
H-4



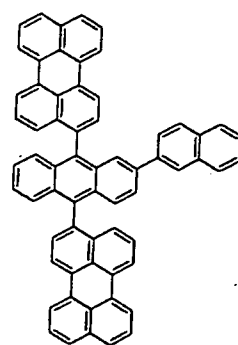
H-5



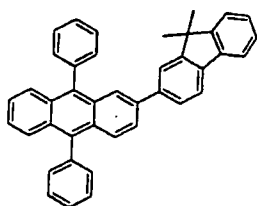
H-6



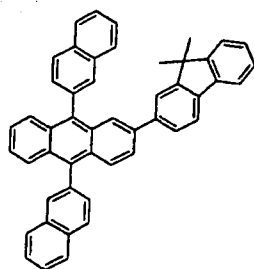
H-7



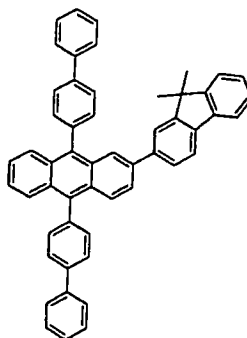
H-8



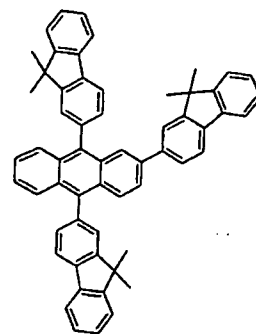
H-9



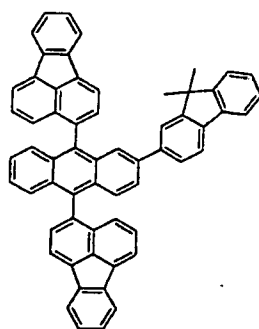
H-10



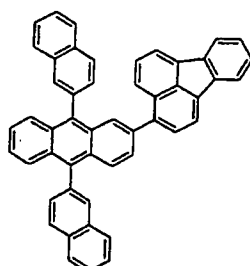
H-11



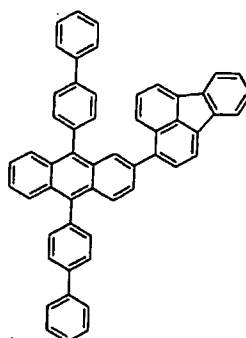
H-12



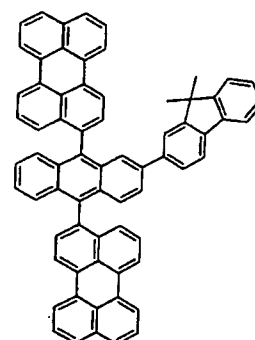
H-13



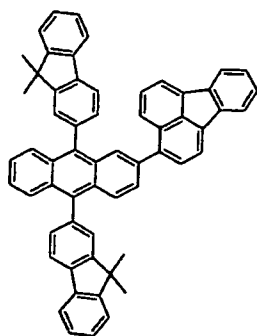
H-14



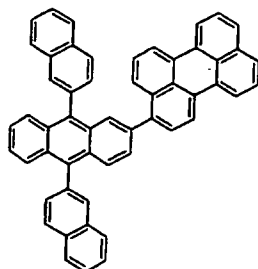
H-15



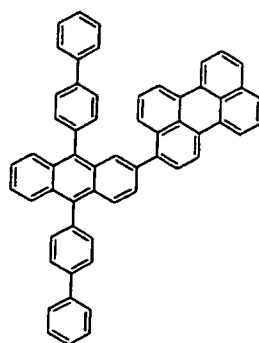
H-16



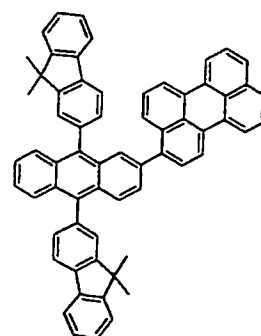
H-17



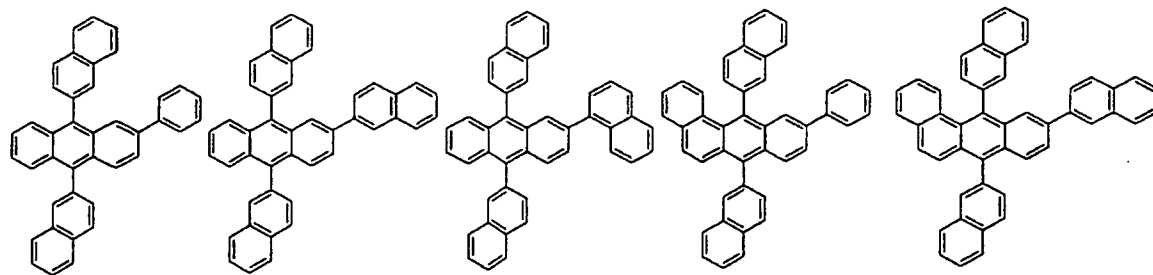
H-18



H-19



H-20



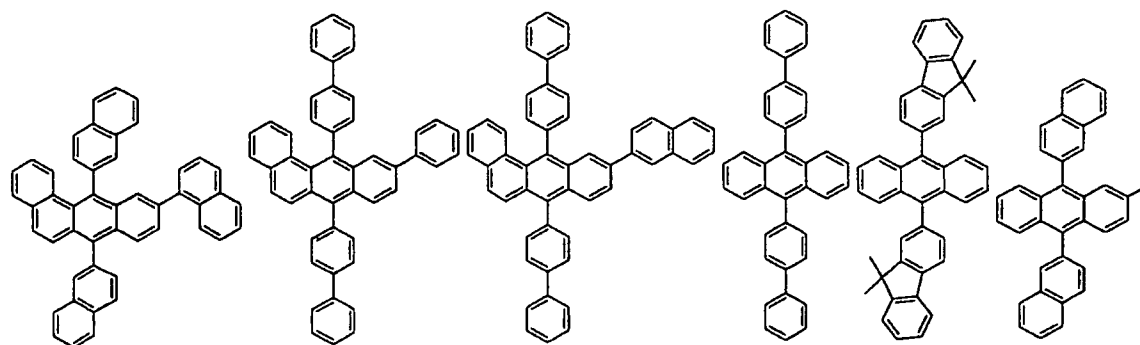
H-21

H-22

H-23

H-24

H-25



H-26

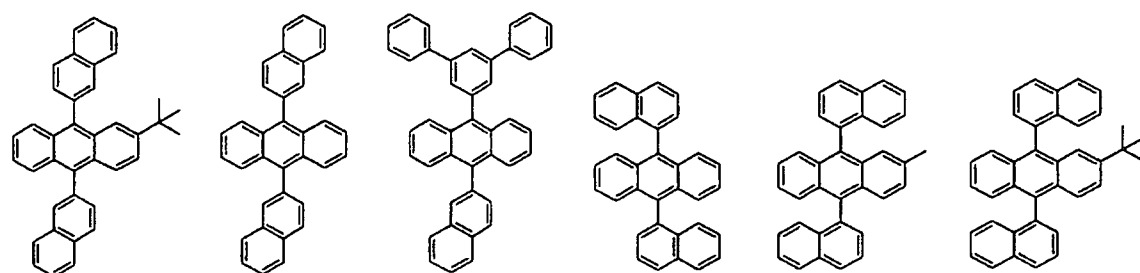
H-27

H-28

H-29

H-30

H-31



H-32

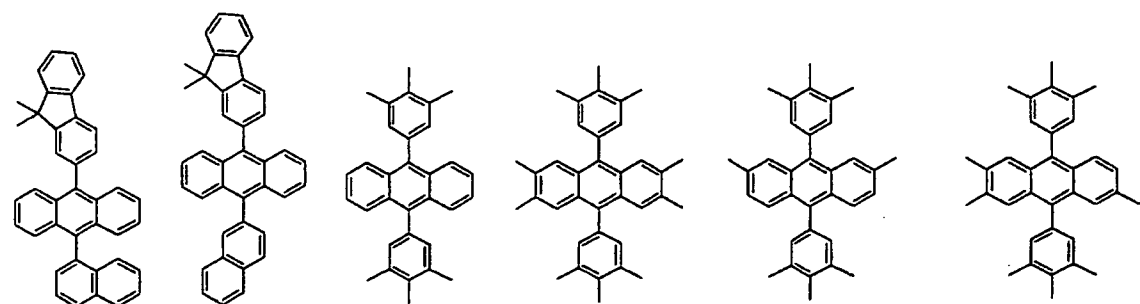
H-33

H-34

H-35

H-36

H-37



H-38

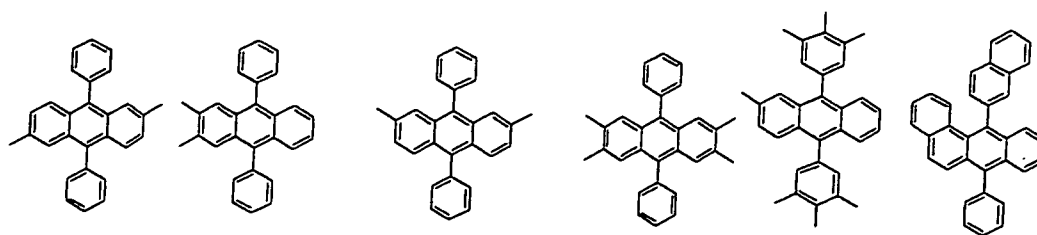
H-39

H-40

H-41

H-42

H-43



H-44

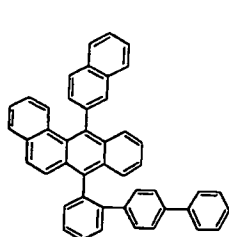
H-45

H-46

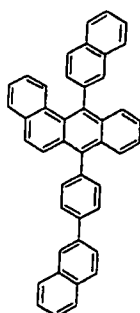
H-47

H-48

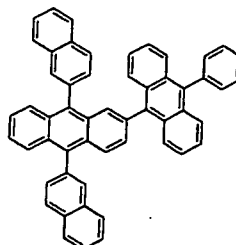
H-49



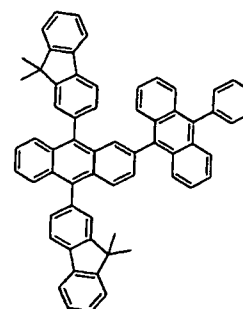
H-50



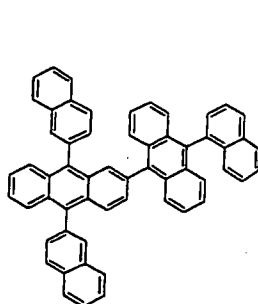
H-51



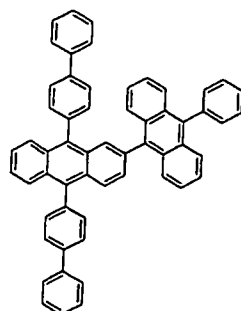
H-52



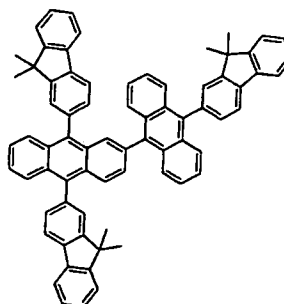
H-53



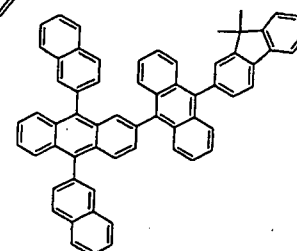
H-54



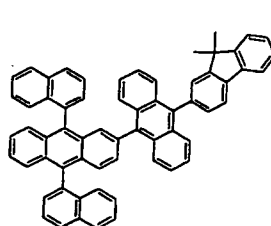
H-55



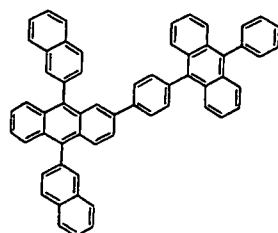
H-56



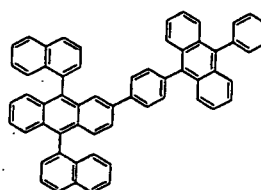
H-57



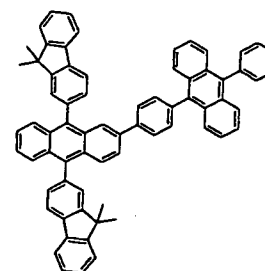
H-58



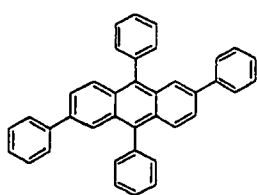
H-59



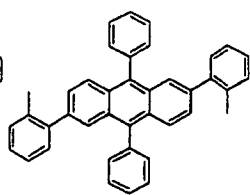
H-60



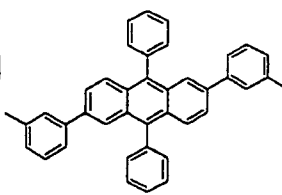
H-61



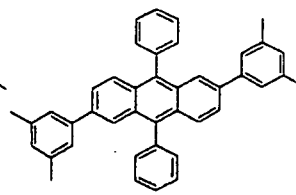
H-62



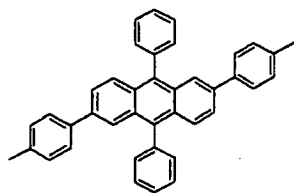
H-63



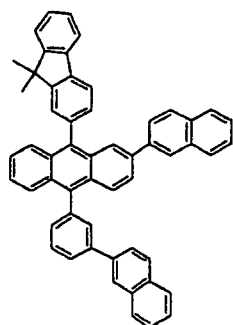
H-64



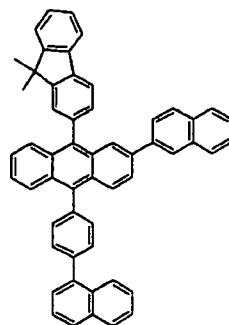
H-65



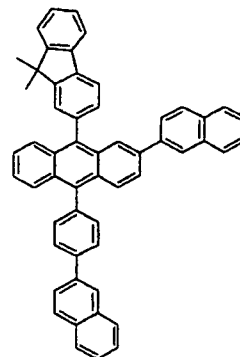
H-66



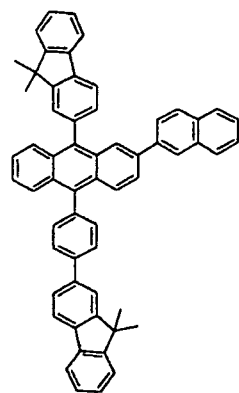
H-67



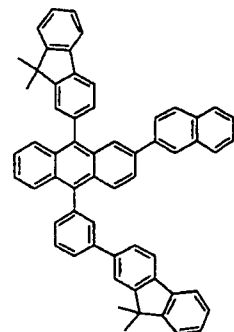
H-68



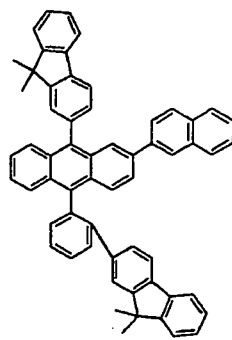
H-69



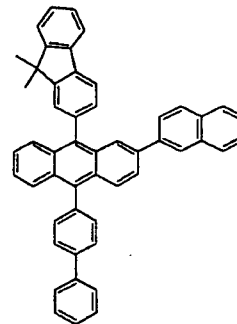
H-70



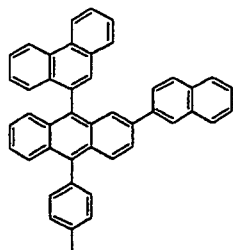
H-71



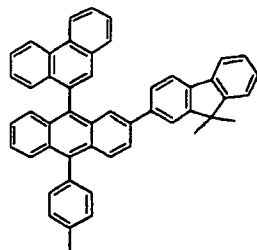
H-72



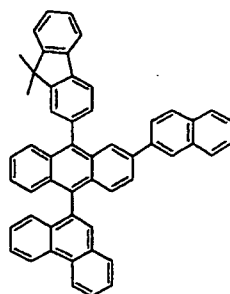
H-73



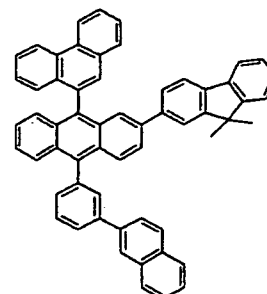
H-74



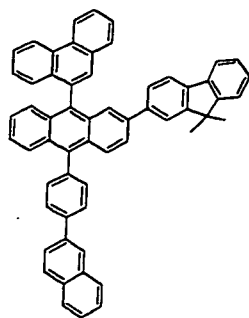
H-75



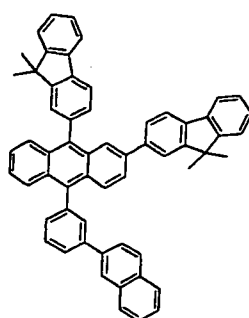
H-76



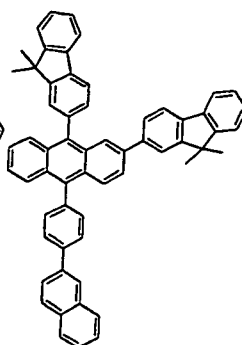
H-77



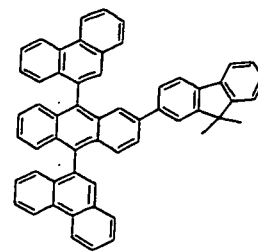
H-78



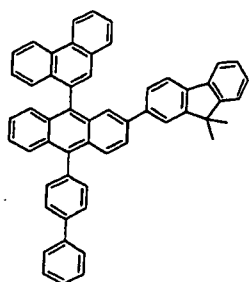
H-79



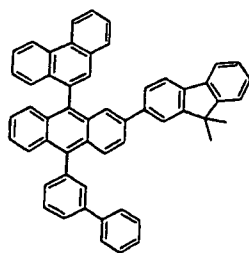
H-80



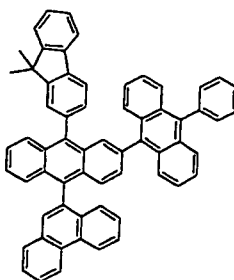
H-81



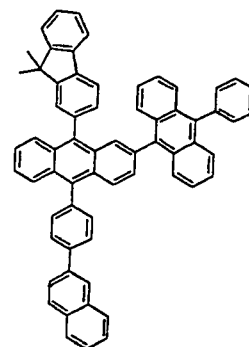
H-82



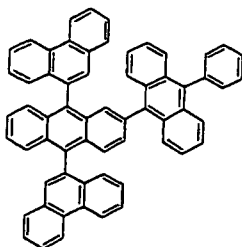
H-83



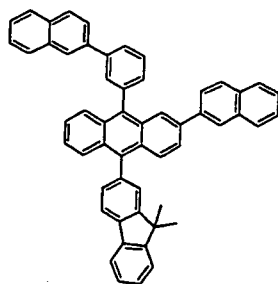
H-84



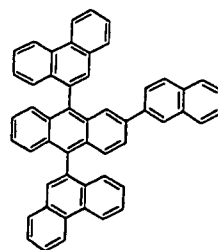
H-85



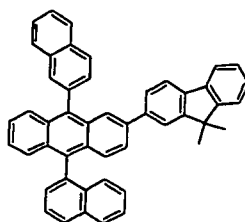
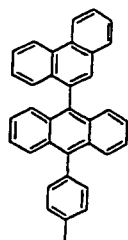
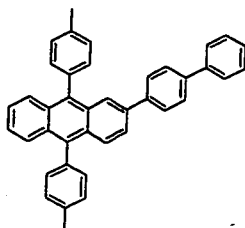
H-86



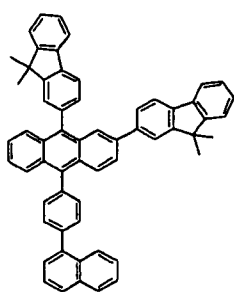
H-87



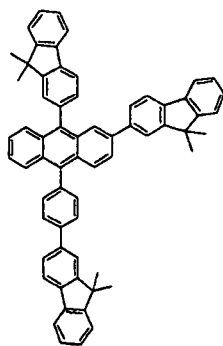
H-88



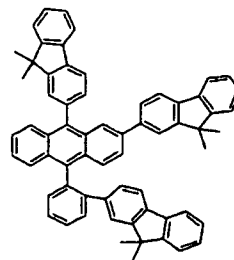
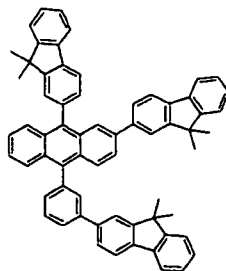
H-89



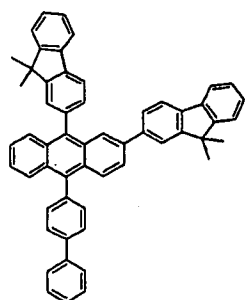
H-90



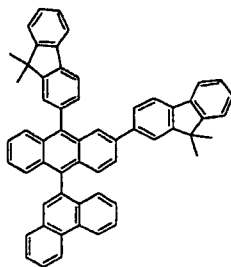
H-91



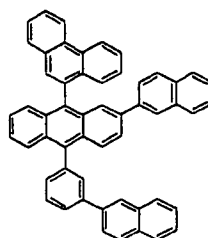
H-92



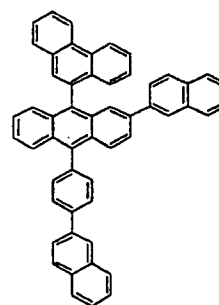
H-93



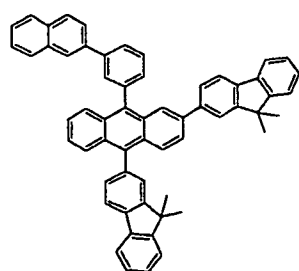
H-94



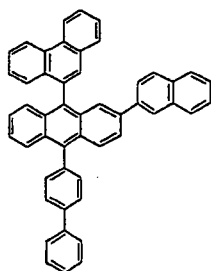
H-95



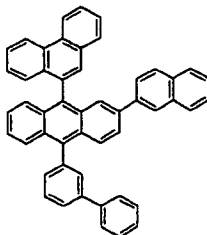
H-96



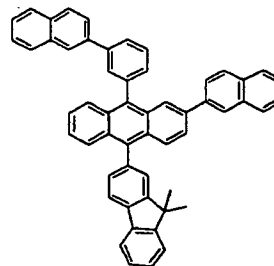
H-97



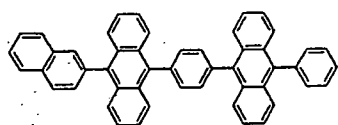
H-98



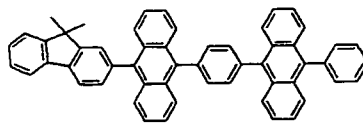
H-99



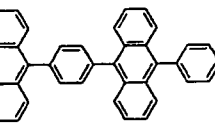
H-100



H-101

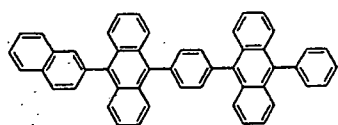


H-102

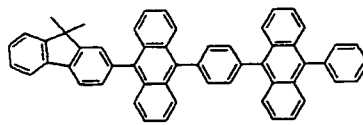


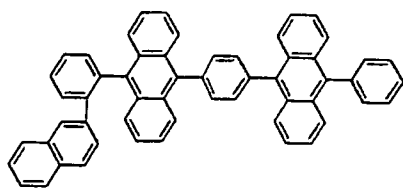
H-103

H-104

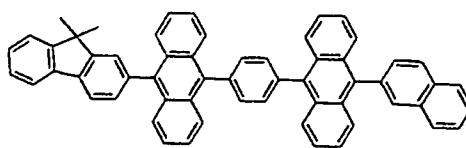


H-105

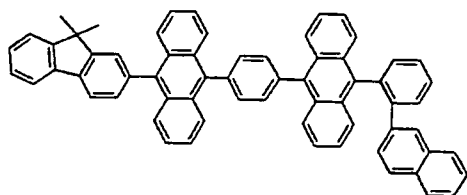




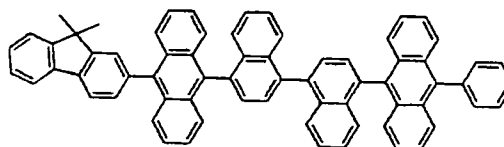
H-106



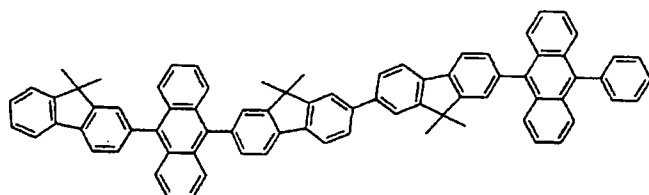
H-107



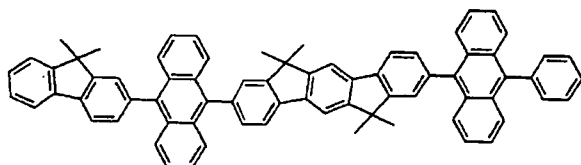
H-108



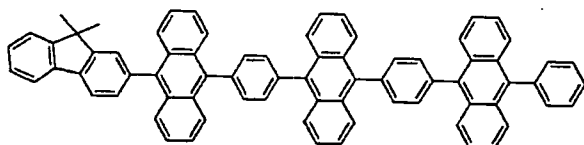
H-109



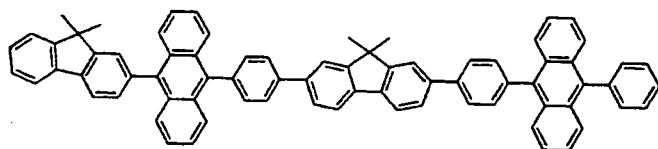
H-110



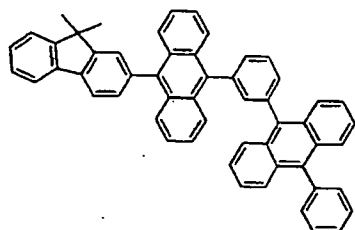
H-111



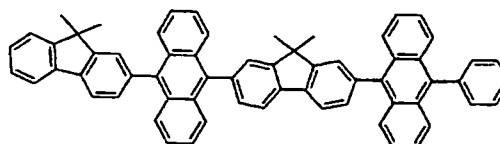
H-112



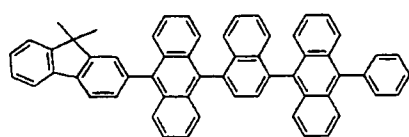
H-113



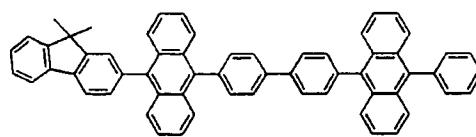
H-114



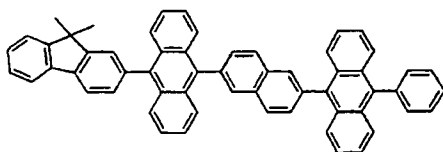
H-115



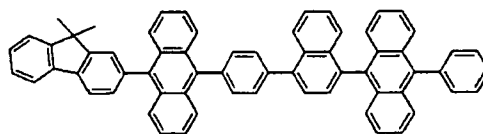
H-116



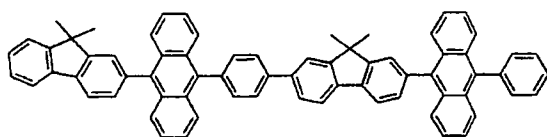
H-117



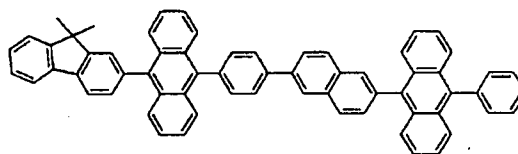
H-118



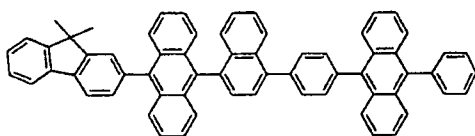
H-119



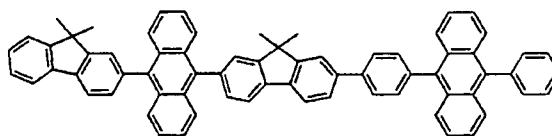
H-120



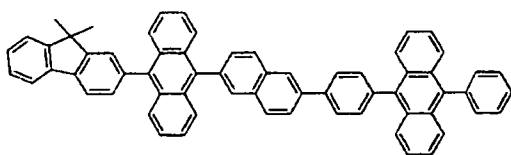
H-121



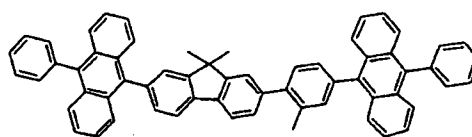
H-122



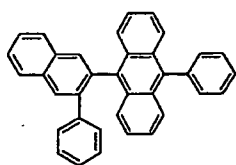
H-123



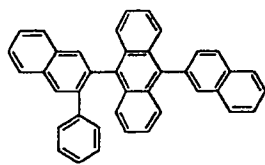
H-124



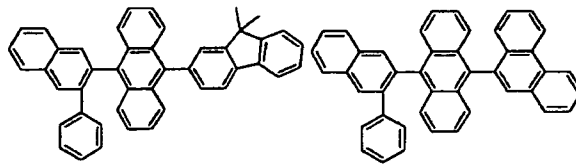
H-125



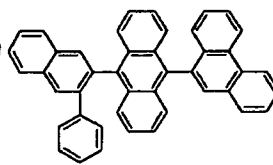
H-126



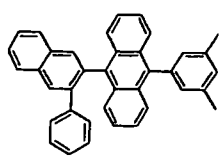
H-127



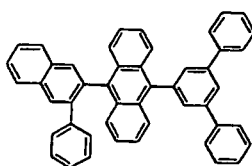
H-128



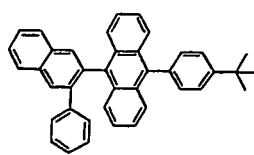
H-129



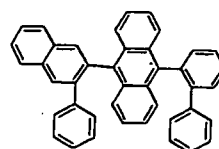
H-130



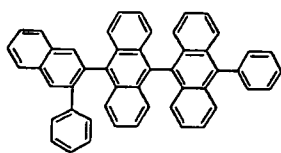
H-131



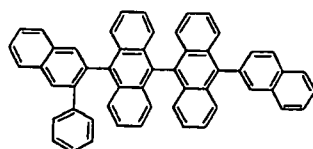
H-132



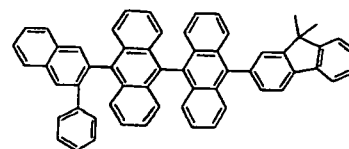
H-133



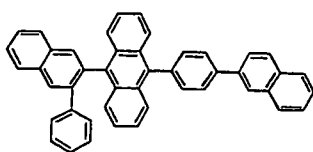
H-134



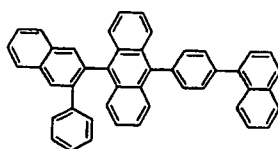
H-135



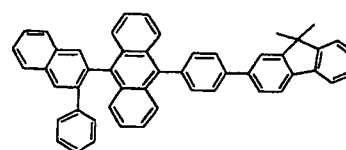
H-136



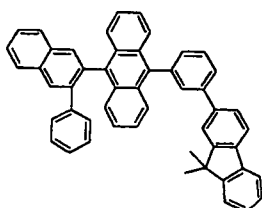
H-137



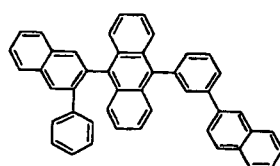
H-138



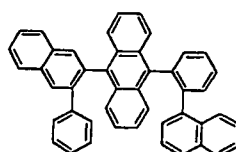
H-139



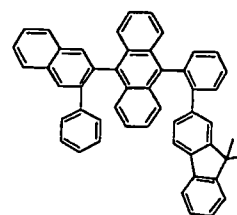
H-140



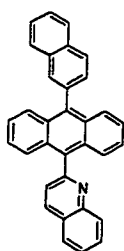
H-141



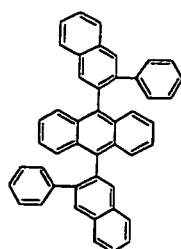
H-142



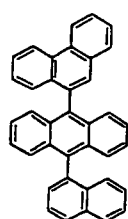
H-143



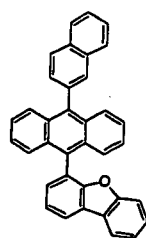
H-144



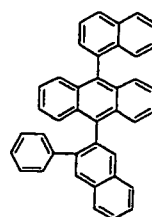
H-145



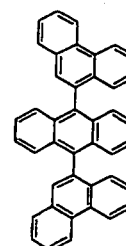
H-146



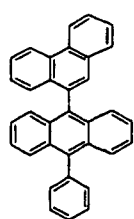
H-147



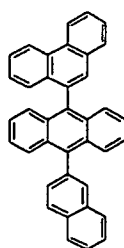
H-148



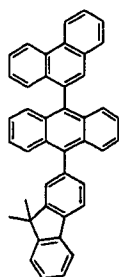
H-149



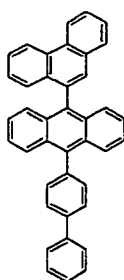
H-150



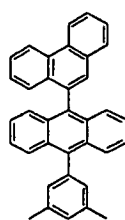
H-151



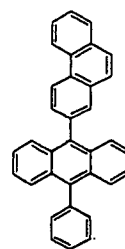
H-152



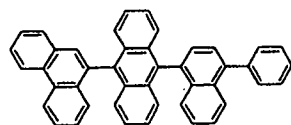
H-153



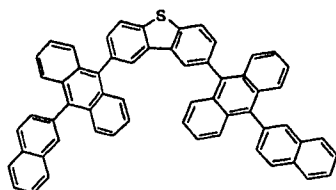
H-154



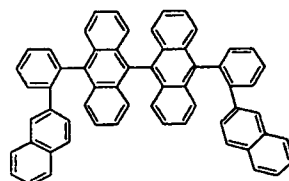
H-155



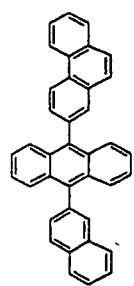
H-156



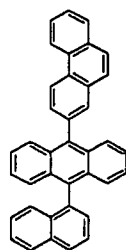
H-157



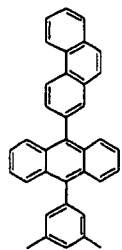
H-158



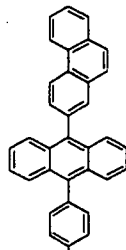
H-159



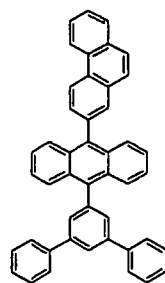
H-160



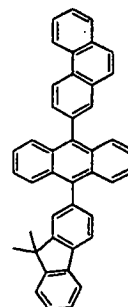
H-161



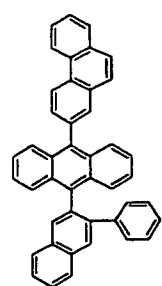
H-162



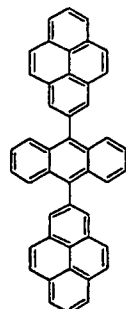
H-163



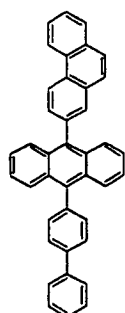
H-164



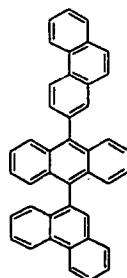
H-165



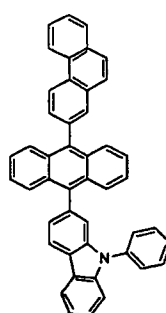
H-166



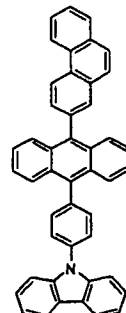
H-167



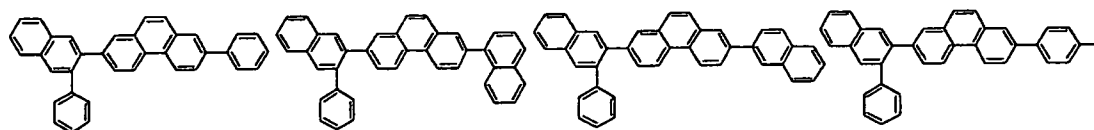
H-168



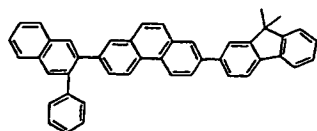
H-169



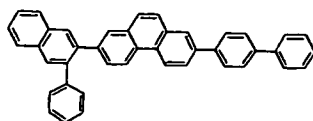
H-170



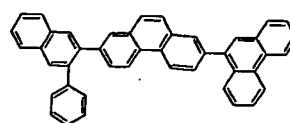
H-171



H-172

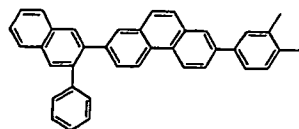


H-173

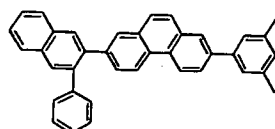


H-174

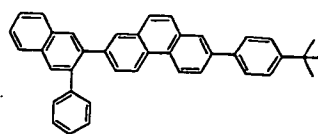
H-175



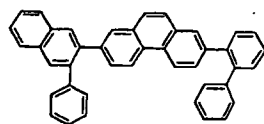
H-176



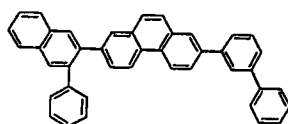
H-177



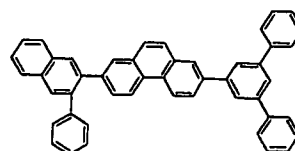
H-178



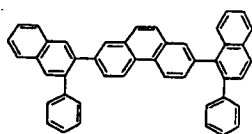
H-179



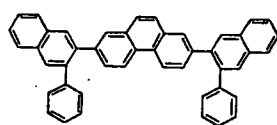
H-180



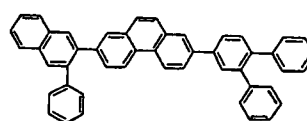
H-181



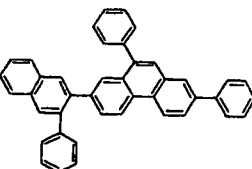
H-182



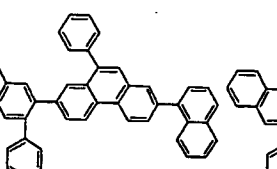
H-183



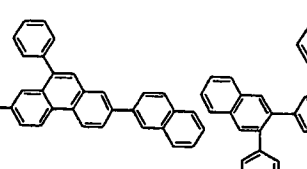
H-184



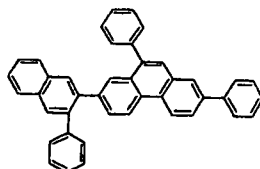
H-185



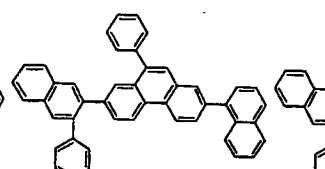
H-186



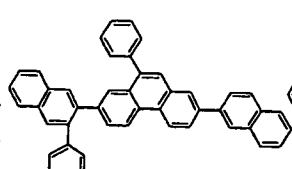
H-187



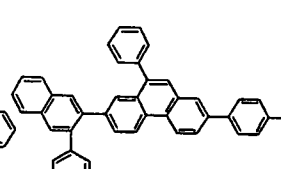
H-188



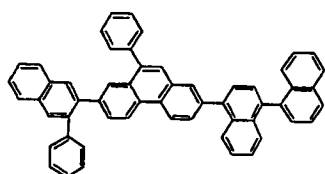
H-189



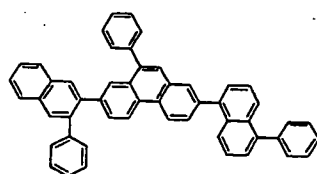
H-190



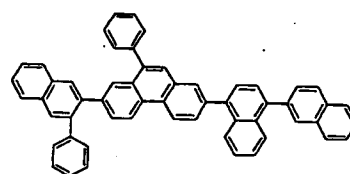
H-191

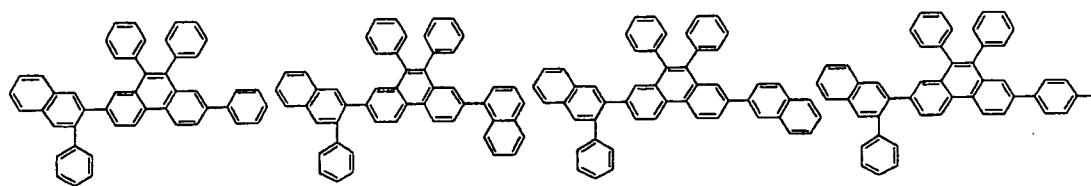


H-192



H-193



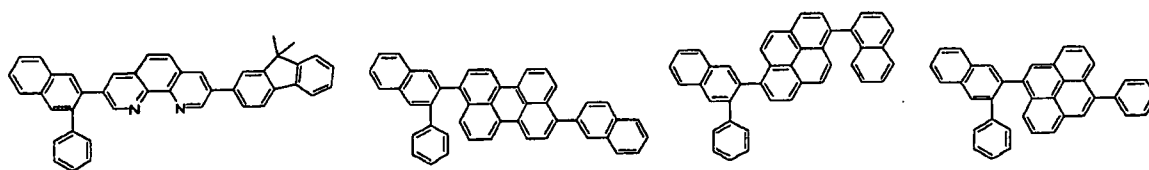


H-194

H-195

H-196

H-197

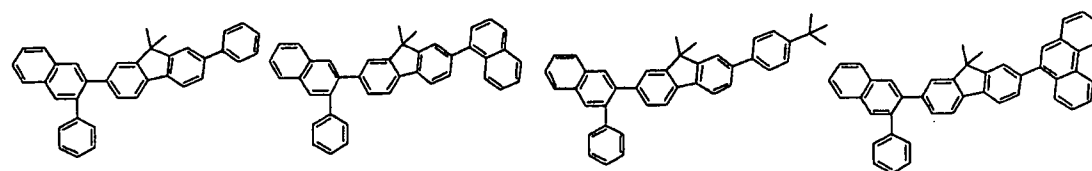


H-198

H-199

H-200

H-201

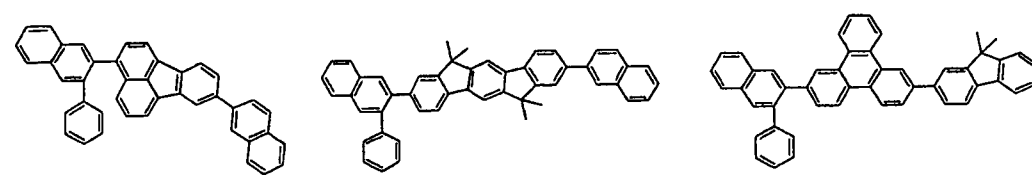


H-202

H-203

H-204

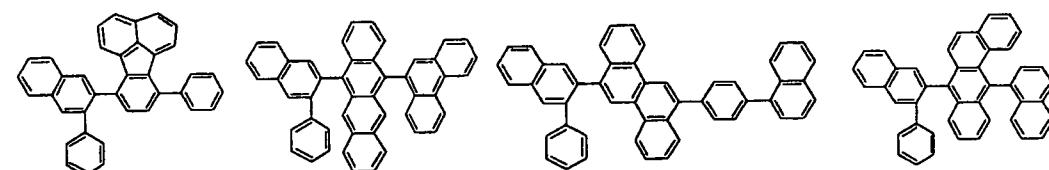
H-205



H-206

H-207

H-208

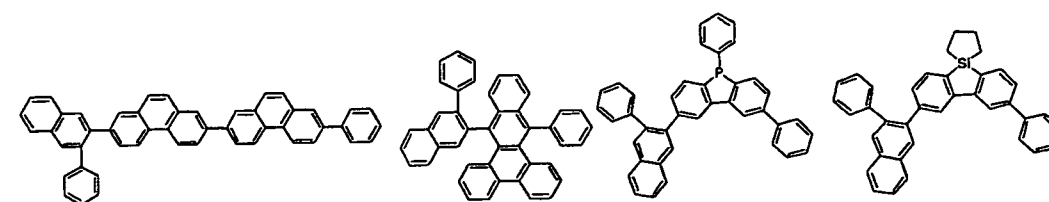


H-209

H-210

H-211

H-212

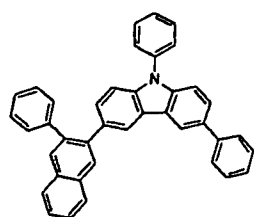


H-213

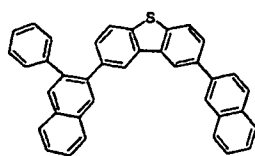
H-214

H-215

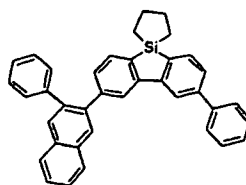
H-216



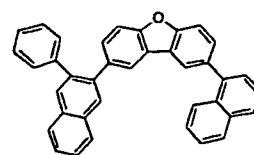
H-217



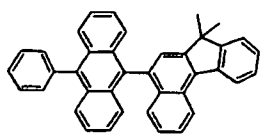
H-218



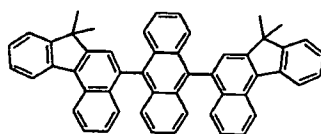
H-219



H-220



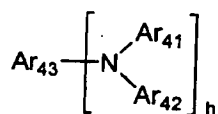
H-221



H-222

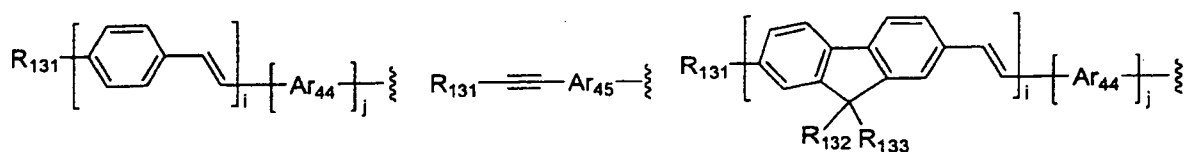
根據本發明之有機電致發光裝置可復包括一種或多種選自芳基胺化合物及苯乙烯基芳基胺化合物之化合物，以及化學式(1)所示之有機電致發光化合物。芳基胺或苯乙烯基芳基胺化合物之實例包括，但不限於化學式(8)所示之化合物：

化學式(8)

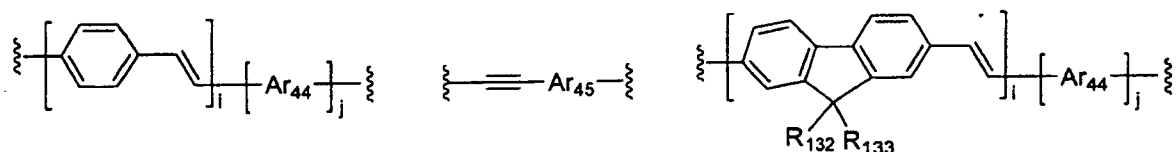


其中， Ar_{41} 與 Ar_{42} 係獨立地表示(C1-C60)烷基、(C6-C60)芳基、(C4-C60)雜芳基、(C6-C60)芳基胺基、(C1-C60)烷基胺基、含有一個或多個選自 N、O 及 S 之雜原子之 5 員或 6 員雜環烷基或(C3-C60)環烷基，或者 Ar_{41} 與 Ar_{42} 可經由含有或不含有稠合環之(C3-C60)伸烷基或(C3-C60)伸烯基相鍵聯以形成脂環、或單環或多環之芳香環；

當 h 為 1 時， Ar_{43} 表示(C6-C60)芳基、(C4-C60)雜芳基，或如下列結構式中之 one 者所表示之取代基：



當 h 為 2 時， Ar_{43} 表示 (C6-C60) 伸芳基、(C4-C60) 雜伸芳基，或如下列結構所表示之取代基：



其中， Ar_{44} 與 Ar_{45} 係獨立地表示 (C6-C60) 伸芳基或 (C4-C60) 雜伸芳基；

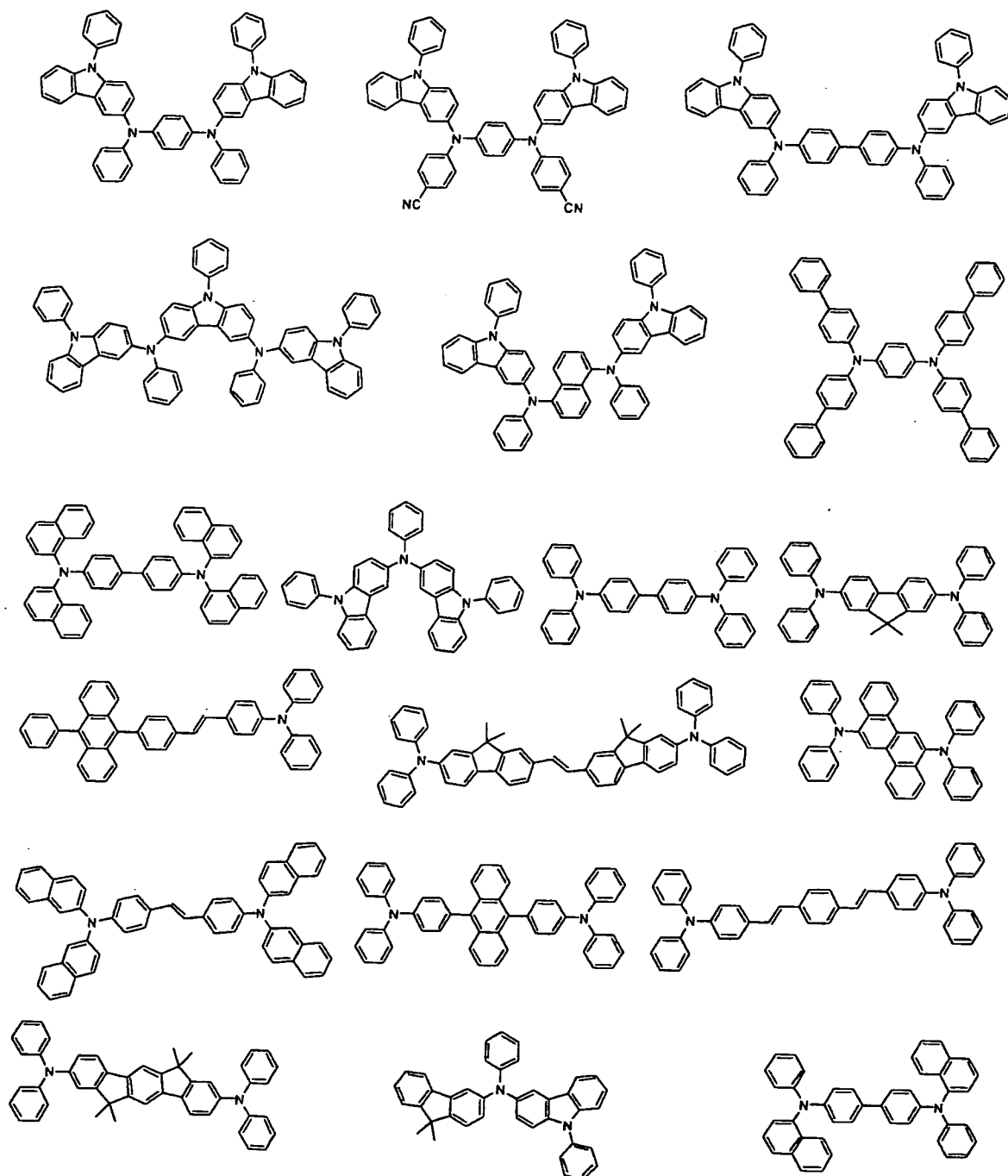
R_{131} 至 R_{133} 係獨立地表示氫、氘、(C1-C60) 烷基或 (C6-C60) 芳基；

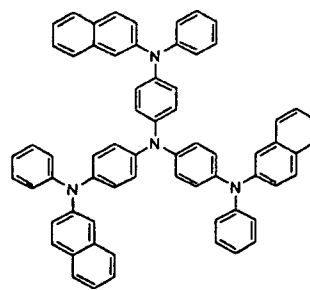
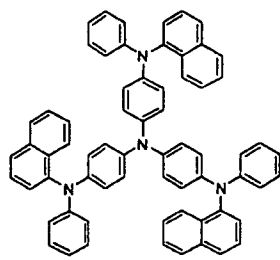
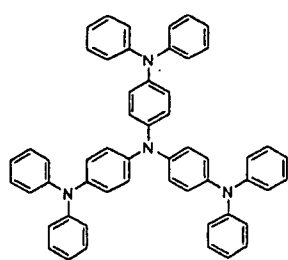
i 為 1 至 4 之整數， j 為整數 0 或 1；以及

Ar_{41} 與 Ar_{42} 之烷基、芳基、雜芳基、芳基胺基、烷基胺基、環烷基及雜環烷基，或者 Ar_{43} 之芳基、雜芳基、伸芳基或雜伸芳基，或者 Ar_{44} 與 Ar_{45} 之伸芳基或雜伸芳基，或者 R_{131} 至 R_{133} 之烷基或芳基可進一步經一個或多個選自下列所組成群組之取代基取代：氫、鹵素、(C1-C60) 烷基、(C6-C60) 芳基、(C4-C60) 雜芳基、含有一個或多個選自 N、O 及 S 之雜原子之 5 員或 6 員雜環烷基、(C3-C60) 環烷基、三(C1-C60) 烷基矽烷基、二(C1-C60) 烷基(C6-C60) 芳基矽烷基、三(C6-C60) 芳基矽烷基、金剛烷基、(C7-C60) 雙環烷基、(C2-C60) 烯基、(C2-C60) 炔基、氰基、(C1-C60) 烷基胺基、(C6-C60) 芳基胺基、(C6-C60) 芳(C1-C60) 烷基、

(C6-C60)芳氧基、(C1-C60)烷氧基、(C6-C60)芳基硫基、
(C1-C60)烷基硫基、(C1-C60)烷氧基羰基、(C1-C60)烷基
羰基、(C6-C60)芳基羰基、羧基、硝基及羧基。

芳基胺化合物及苯乙烯基芳基胺化合物可由下列化
合物更具體例示，但不限於下列化合物。



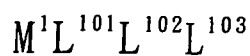


於根據本發明之有機電致發光裝置中，有機層復包括一種或多種選自下列所組成群組之金屬：元素周期表中之第 1 族之有機金屬、第 2 族之有機金屬、第 4 周期與第 5 周期之過渡金屬、鑰系金屬及 d-過渡元素，以及化學式(1)所示之有機電致發光化合物。有機層可同時包括電致發光層及電荷產生層。

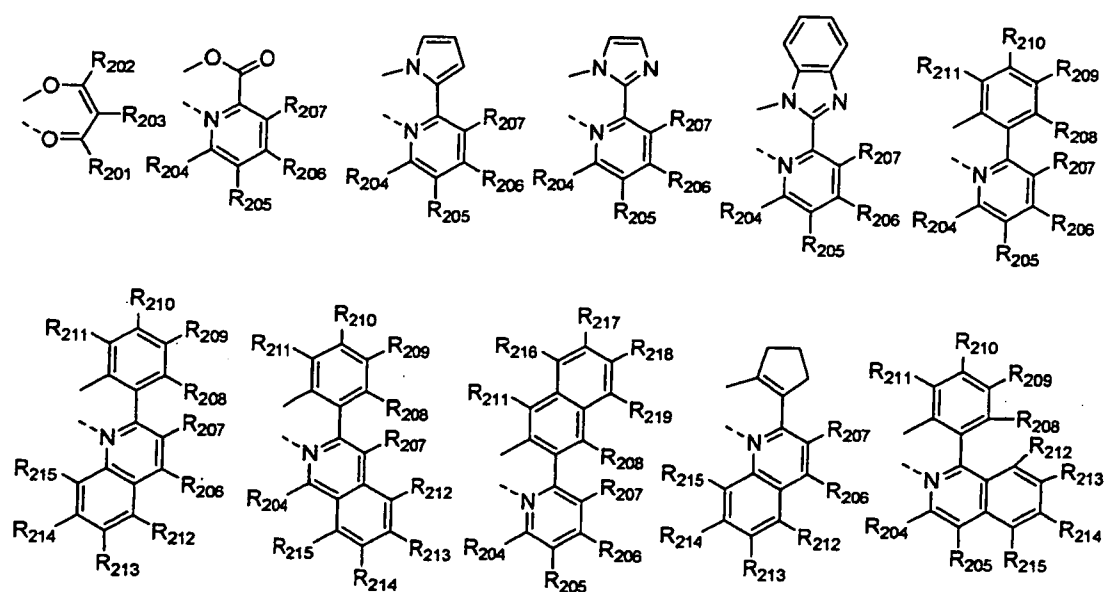
本發明可實現具有獨立發光模式之像素結構的電致發光裝置，其係同時經平行圖案化，包括含有化學式(1)所示之化合物作為次像素；以及一種或多種包括一種或多種選自下列所組成群組之金屬化合物之次像素：Ir、Pt、Pd、Rh、Re、Os、Tl、Pb、Bi、In、Sn、Sb、Te、Au 及 Ag 的有機電致發光裝置。

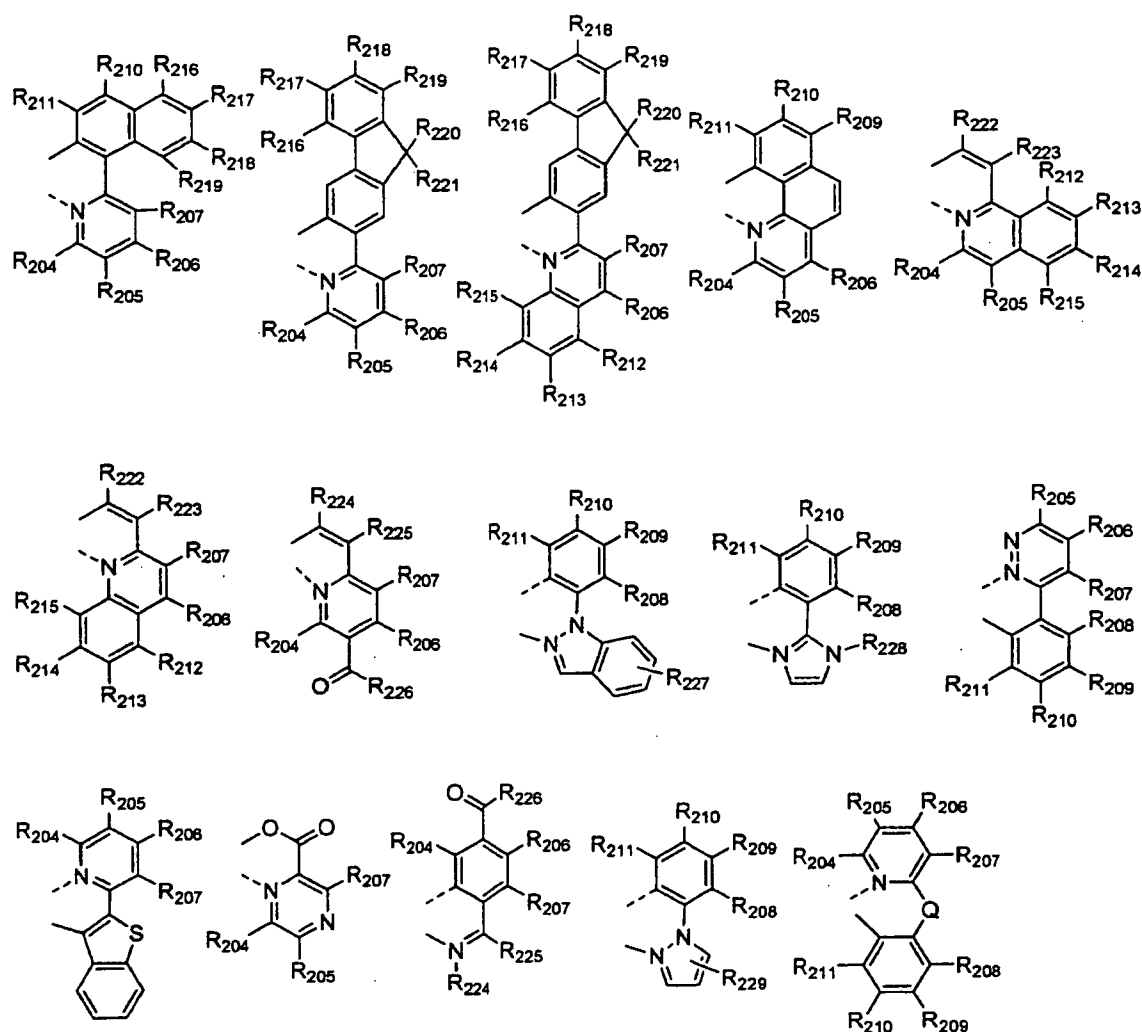
再者，有機電致發光裝置為有機顯示器，其中，有機層除了包括化學式(1)所示之有機電致發光化合物外，復同時包括一種或多種選自具有波長為 500 奈米(nm)至 560nm 的電致發光峰之化合物、或具有波長不小於 560nm 的電致發光峰之化合物。具有波長為 500nm 至 560nm 的電致發光峰之化合物或具有波長不小於 560nm 的電致發光峰之化合物可由化學式(9)至化學式(15)中之一所示之化合物例示，但不限於此。

化學式(9)



於化學式(9)中， M^1 為選自元素周期表中之第 7 族、第 8 族、第 9 族、第 10 族、第 11 族、第 13 族、第 14 族、第 15 族及第 16 族金屬，而配位基 L^{101} 、 L^{102} 及 L^{103} 係獨立地選自下列結構：





其中，R₂₀₁至 R₂₀₃係獨立地表示氫、氘、含有或不含有鹵素取代基之(C1-C60)烷基、含有或不含有(C1-C60)烷基取代基之(C6-C60)芳基或鹵素；

R₂₀₄至 R₂₁₉係獨立地表示氫、氘、(C1-C60)烷基、(C1-C30)烷氧基、(C3-C60)環烷基、(C2-C30)烯基、(C6-C60)芳基、單或二(C1-C30)烷基胺基、單或二(C6-C30)芳基胺基、SF₅、三(C1-C30)烷基矽烷基、二(C1-C30)烷基(C6-C30)芳基矽烷基、三(C6-C30)芳基矽烷基、氰基或鹵素，且 R₂₀₄至 R₂₁₉之烷基、環烷基、烯基或芳基可進一步經一個或多個選自氘、(C1-C60)烷基、(C6-C60)芳基及鹵素之取代基

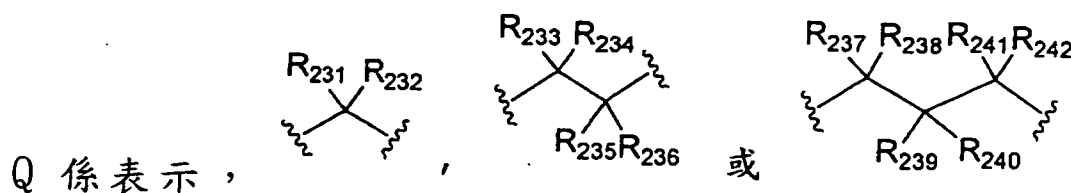
取代；

R_{220} 至 R_{223} 係獨立地表示氫、氖、含有或不含有鹵素取代基之(C1-C60)烷基、含有或不含有(C1-C60)烷基取代基之(C6-C60)芳基；

R_{224} 與 R_{225} 係獨立地表示氫、氖、(C1-C60)烷基、(C6-C60)芳基或鹵素，或 R_{224} 與 R_{225} 可經由含有或不含有稠合環之(C3-C12)伸烷基或(C3-C12)伸烯基相鍵聯以形成脂環、或單環或多環之芳香環；且 R_{224} 與 R_{225} 之烷基或芳基，或 R_{224} 與 R_{225} 經由含有或不含有稠合環之(C3-C12)伸烷基或(C3-C12)伸烯基所構成之脂環、單環或多環之芳香環可進一步經一個或多個選自氖、含有或不含有鹵素取代基之(C1-C60)烷基、(C1-C30)烷氧基、鹵素、三(C1-C30)烷基矽烷基、三(C6-C30)芳基矽烷基及(C6-C60)芳基之取代基取代；

R_{226} 係表示(C1-C60)烷基、(C6-C60)芳基、或含有一個或多個選自 N、O 及 S 之雜原子之(C5-C60)雜芳基或鹵素；

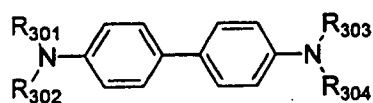
R_{227} 至 R_{229} 係獨立地表示氫、氖、(C1-C60)烷基、(C6-C60)芳基或鹵素，且 R_{226} 至 R_{229} 之烷基或芳基可進一步經鹵素或(C1-C60)烷基取代；



且 R_{231} 至 R_{242} 係獨立地表示氫、氖、含有或不含有鹵素取代基之(C1-C60)烷基、(C1-C30)烷氧基、鹵素、(C6-C60)芳

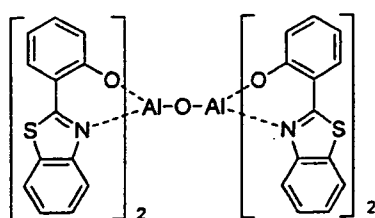
基、氰基或(C5-C60)環烷基；或者 R_{231} 至 R_{242} 可個別經由伸烷基或伸烯基與相鄰取代基鍵聯以形成(C5-C7)螺環或(C5-C9)稠合環；或者彼等基可個別經由伸烷基或伸烯基與 R_{207} 或 R_{208} 鍵聯以形成(C5-C7)稠合環。

化學式(10)

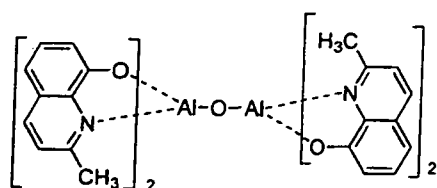


於化學式(10)中， R_{301} 至 R_{304} 係獨立地表示(C1-C60)烷基或(C6-C60)芳基，或者 R_{301} 至 R_{304} 可個別經由含有或不含有稠合環之(C3-C60)伸烷基或(C3-C60)伸烯基與相鄰取代基鍵聯以形成脂環、或單環或多環之芳香環；且 R_{301} 至 R_{304} 之烷基或芳基，或者 R_{301} 至 R_{304} 經由含有或不含有稠合環之(C3-C60)伸烷基或(C3-C60)伸烯基鍵聯所形成之脂環、或單環或多環之芳香環可進一步經一個或多個選自含有或不含有鹵素取代基之(C1-C60)烷基、(C1-C60)烷氧基、鹵素、三(C1-C60)烷基矽烷基、三(C6-C60)芳基矽烷基及(C6-C60)芳基之取代基取代。

化學式(11)



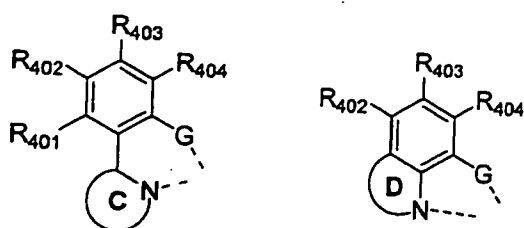
化學式(12)



化學式(13)



於化學式(13)中，配位基 L^{201} 及 L^{202} 係獨立地選自下列結構：



M^2 係二價或三價金屬；

當 M^2 為二價金屬時， k 為 0，而當 M^2 為三價金屬時， k 為 1；

T 係表示(C6-C60)芳氧基或三(C6-C60)芳基矽烷基，且 T 之芳氧基或三芳基矽烷基可進一步經(C1-C60)烷基或(C6-C60)芳基取代；

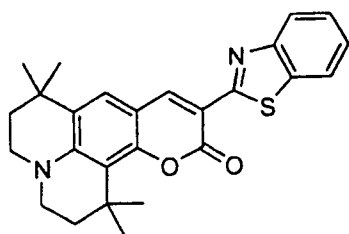
G 係表示 O、S 或 Se；

環 C 係表示噁唑、噻唑、咪唑、噁二唑、噻二唑、苯并噁唑、苯并噻唑、苯并咪唑、吡啶或喹啉；

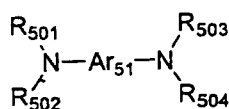
環 D 係表示吡啶或喹啉，且環 D 可進一步經(C1-C60)烷基或者含有或不含有(C1-C60)烷基取代基之苯基或含有或不含有(C1-C60)烷基取代基之萘基取代；

R_{401} 至 R_{404} 係獨立地表示氫、氖、(C1-C60)烷基、鹵素、三(C1-C60)烷基矽烷基、三(C6-C60)芳基矽烷基或(C6-C60)芳基，或者 R_{401} 至 R_{404} 可個別經由(C3-C60)伸烷基或(C3-C60)伸烯基與相鄰取代基鍵聯以形成稠合環，並且環C或環D之吡啶或喹啉可與 R_{401} 形成化學鍵以構成稠合環；

環C或 R_{401} 至 R_{404} 之芳基可進一步經(C1-C60)烷基、鹵素、含有鹵素取代基之(C1-C60)烷基、苯基、萘基、三(C1-C60)烷基矽烷基、三(C6-C60)芳基矽烷基或胺基取代。
化學式(14)



化學式(15)



於化學式(15)中， Ar_{51} 表示含有或不含有一個或多個選自下列所組成之群組之取代基之(C6-C60)伸芳基：鹵素、(C1-C60)烷基、(C6-C60)芳基、(C4-C60)雜芳基、含有一個或多個選自N、O及S之雜原子之5員或6員雜環烷基、(C3-C60)環烷基、三(C1-C60)烷基矽烷基、二(C1-C60)烷基(C6-C60)芳基矽烷基、三(C6-C60)芳基矽烷基、金剛烷基、(C7-C60)雙環烷基、(C2-C60)烯基、(C2-C60)炔基、(C1-C60)烷氧基、氰基、(C1-C60)烷基胺基、(C6-C60)芳

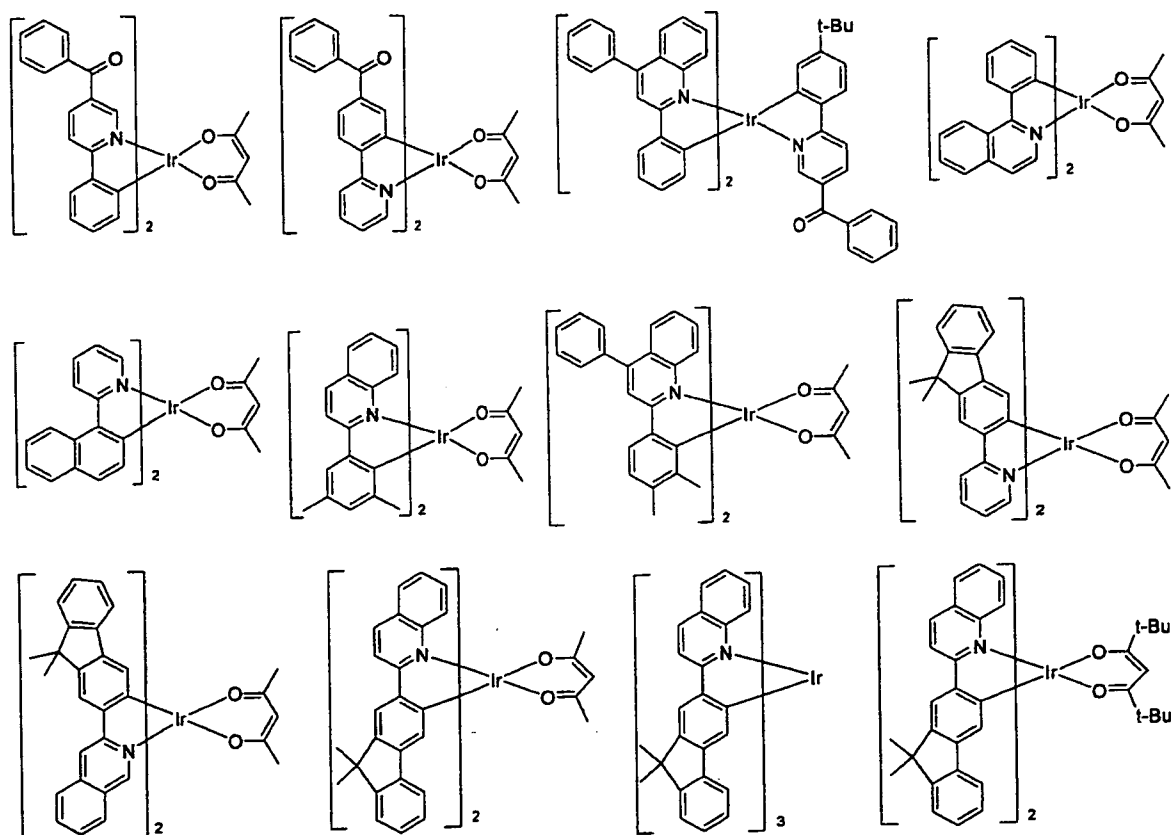
基胺基、(C6-C60)芳基(C1-C60)烷基、(C6-C60)芳氧基、(C6-C60)芳基硫基、(C1-C60)烷氧基羰基、羧基、硝基及羥基；取代於伸芳基之烷基、環烷基、雜環烷基、芳基、雜芳基、芳基矽烷基、烷基矽烷基、烷基胺基及芳基胺基可進一步經一個或多個選自鹵素、(C1-C60)烷基、(C6-C60)芳基、(C4-C60)雜芳基、含有一個或多個選自 N、O 及 S 之雜原子之 5 員或 6 員雜環烷基、(C3-C60)環烷基、三(C1-C60)烷基矽烷基、二(C1-C60)烷基(C6-C60)芳基矽烷基、三(C6-C60)芳基矽烷基、金剛烷基、(C7-C60)雙環烷基、(C2-C60)烯基、(C2-C60)炔基、(C1-C60)烷氧基、氰基、(C1-C60)烷基胺基、(C6-C60)芳基胺基、(C6-C60)芳基(C1-C60)烷基、(C6-C60)芳氧基、(C6-C60)芳基硫基、(C1-C60)烷氧基羰基、羧基、硝基及羥基之取代基取代；

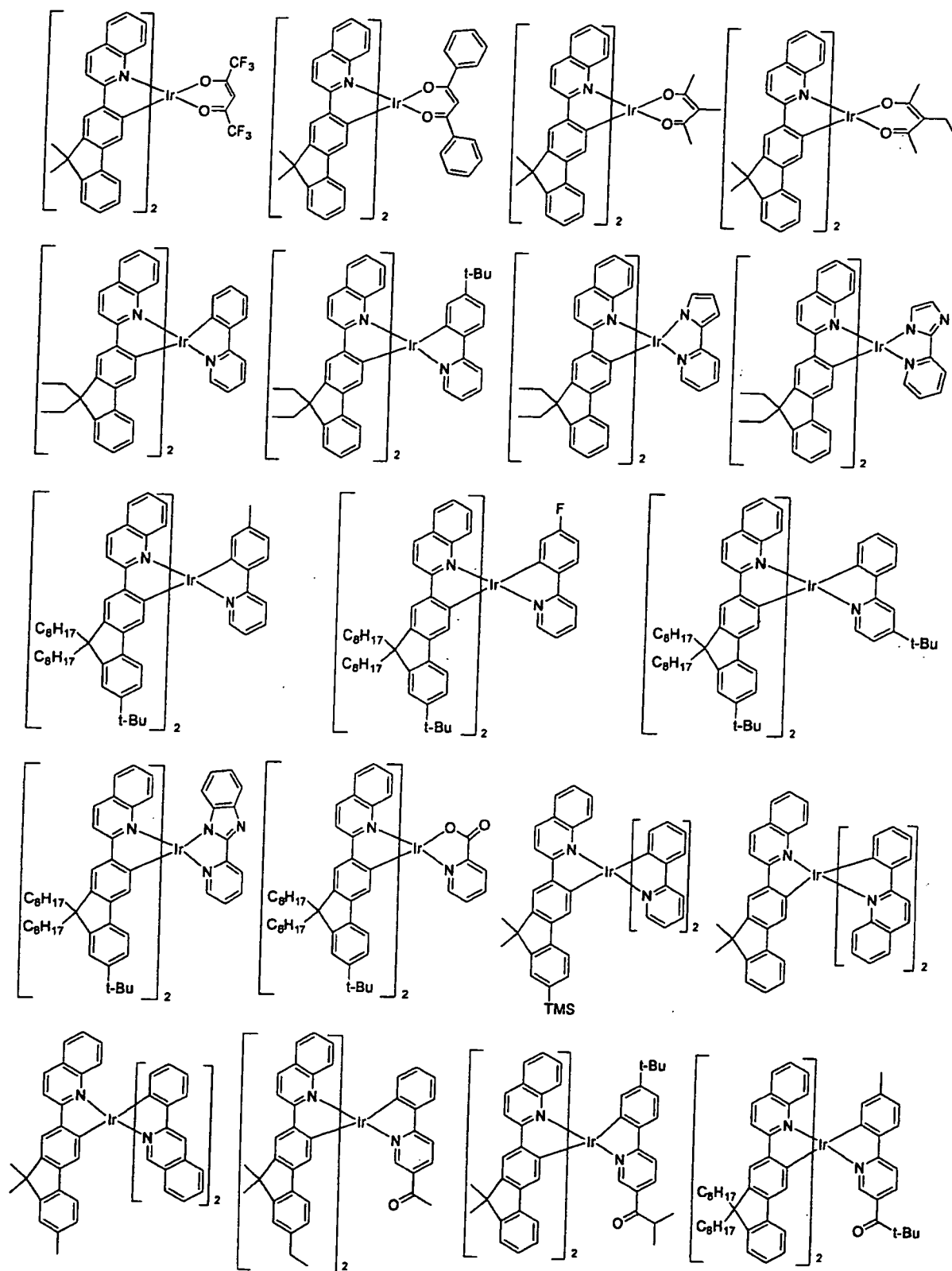
R₅₀₁ 至 R₅₀₄ 係獨立地表示(C1-C60)烷基、(C6-C60)芳基、(C4-C60)雜芳基、(C6-C60)芳基胺基、(C1-C60)烷基胺基、含有一個或多個選自 N、O 及 S 之雜原子之 5 員或 6 員雜環烷基或(C3-C60)環烷基，或者 R₅₀₁ 至 R₅₀₄ 可經由含有或不含有稠合環之(C3-C60)伸烷基或(C3-C60)伸烯基與相鄰取代基鍵聯以形成脂環、或單環或多環之芳香環；以及

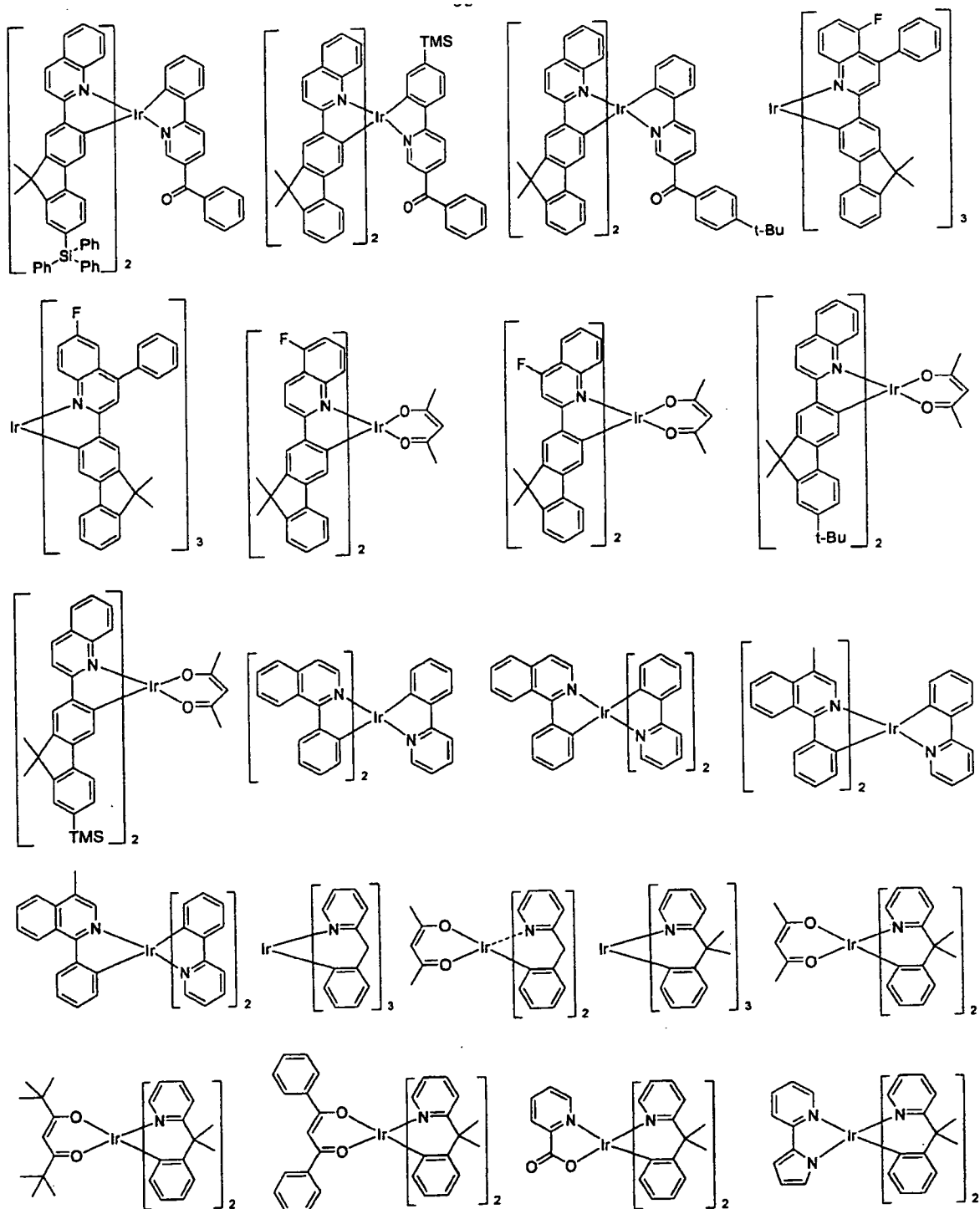
R₅₀₁ 至 R₅₀₄ 之烷基、芳基、雜芳基、芳基胺基、環烷基及雜環烷基可進一步經一個或多個選自鹵素、(C1-C60)烷基、(C6-C60)芳基、(C4-C60)雜芳基、含有一個或多個選自 N、O 及 S 之雜原子之 5 員或 6 員雜環烷基、(C3-C60)環烷基、三(C1-C60)烷基矽烷基、二(C1-C60)烷基(C6-C60)

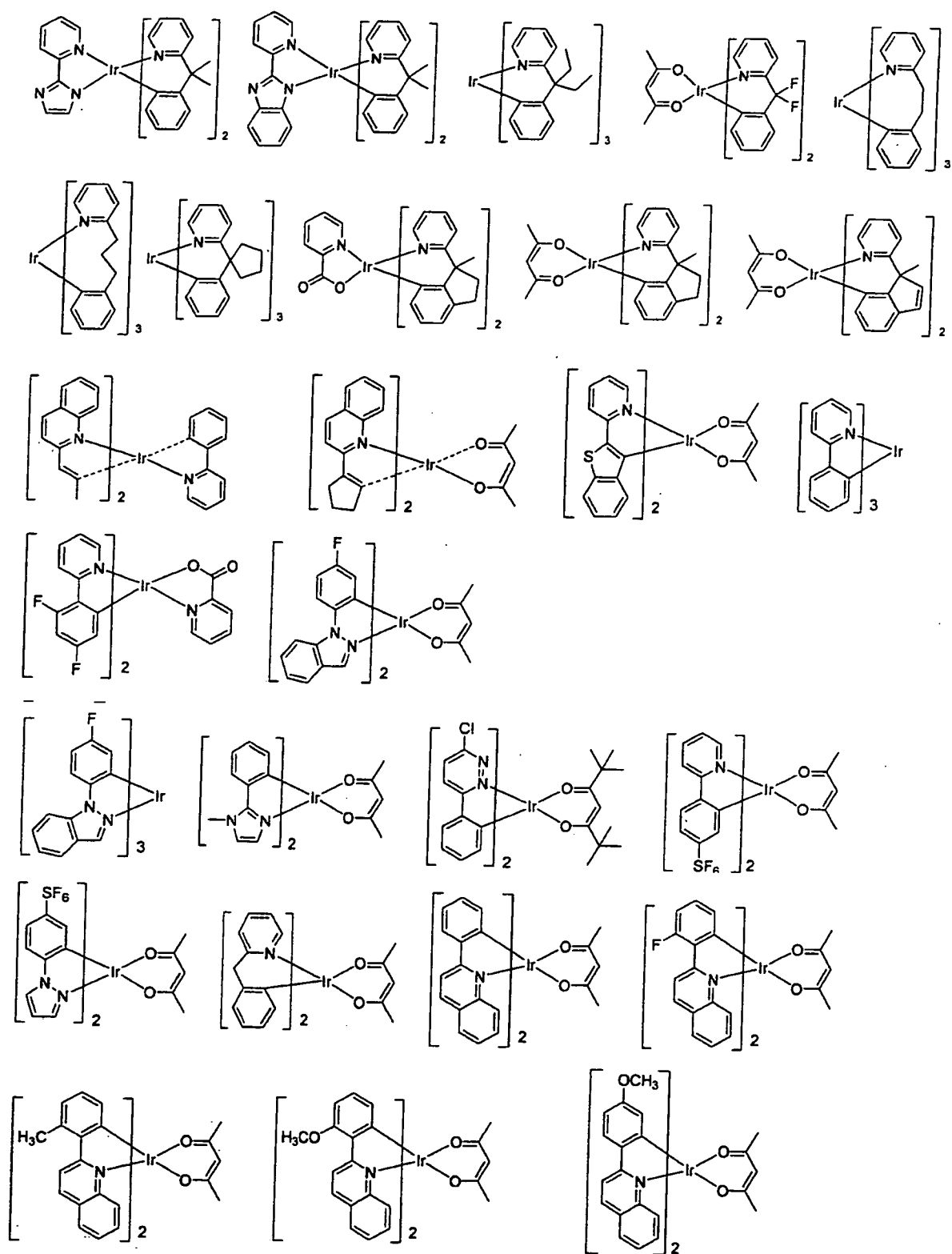
芳基矽烷基、三(C6-C60)芳基矽烷基、金剛烷基、(C7-C60)雙環烷基、(C2-C60)烯基、(C2-C60)炔基、(C1-C60)烷氧基、氰基、(C1-C60)烷基胺基、(C6-C60)芳基胺基、(C6-C60)芳基(C1-C60)烷基、(C6-C60)芳氧基、(C6-C60)芳基硫基、(C1-C60)烷氧基羰基、羧基、硝基及羥基之取代基取代。

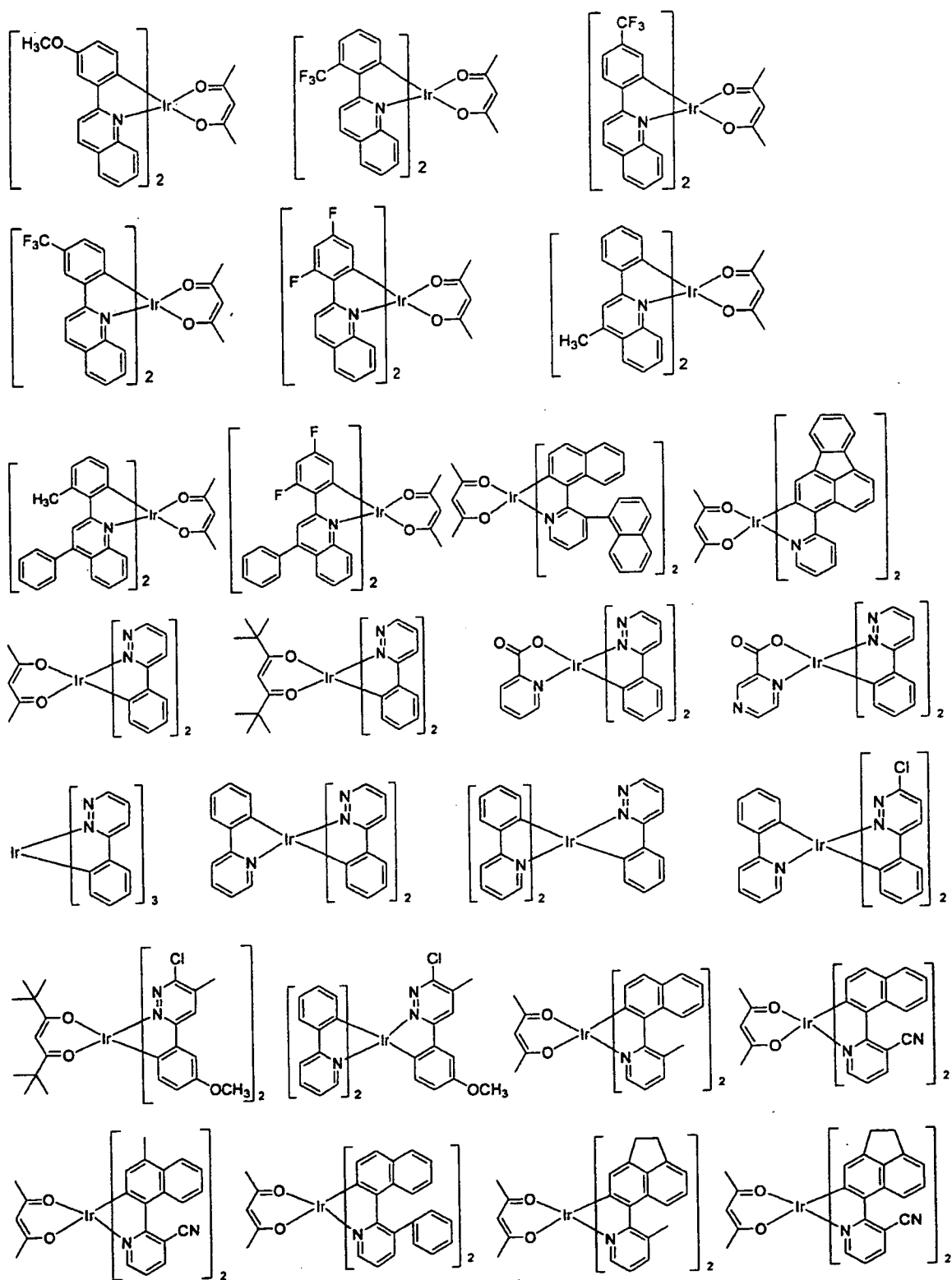
具有波長為 500nm 至 560nm 的電致發光峰之化合物或具有波長不小於 560nm 的電致發光峰之化合物可由下列化合物例示，但不限於下列化合物。

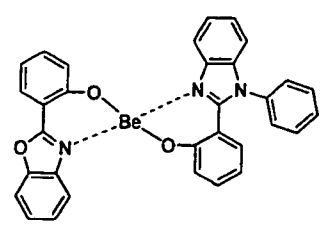
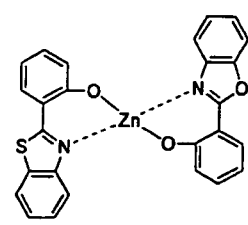
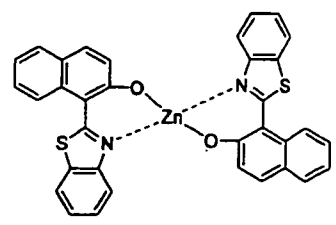
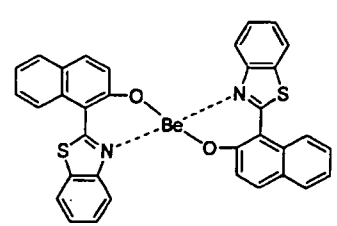
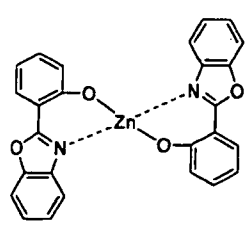
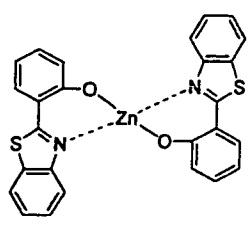
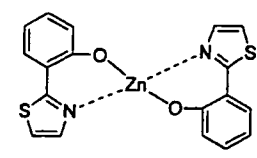
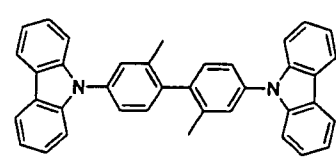
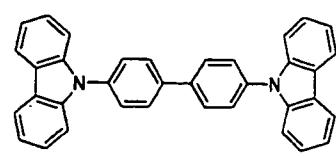
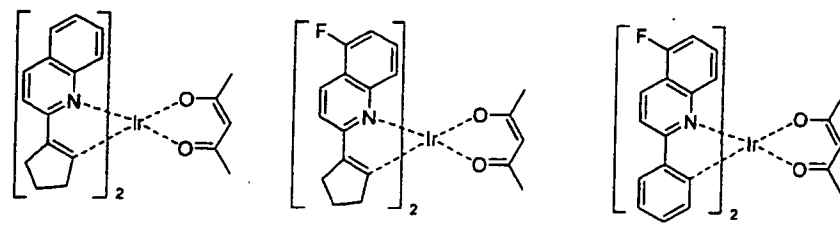
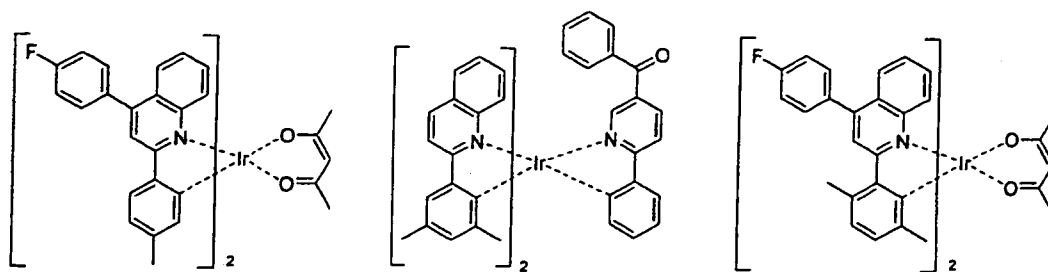
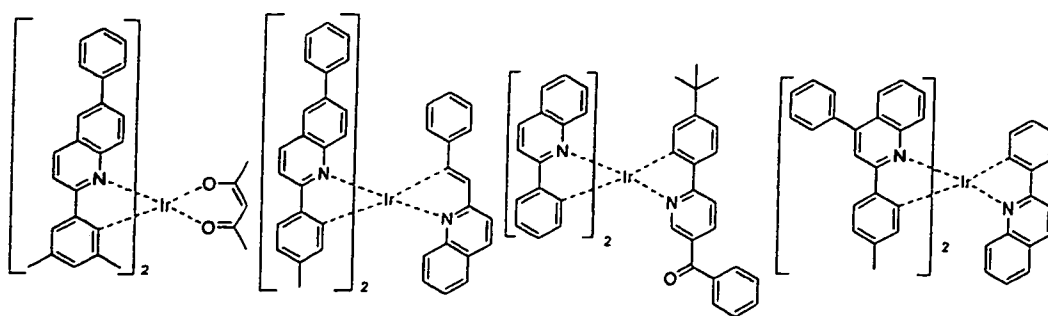


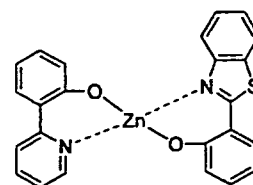
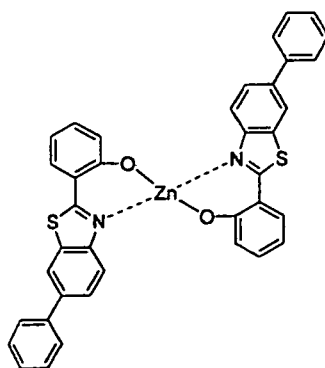
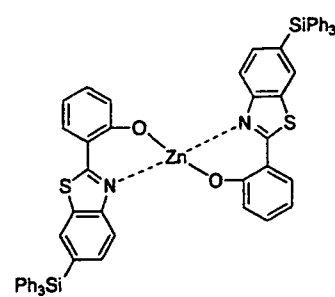
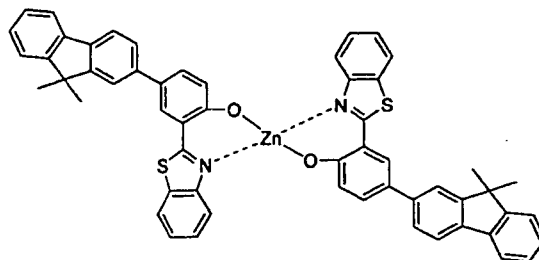
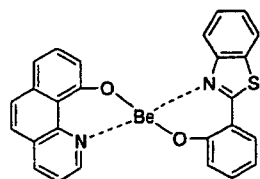
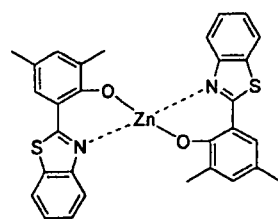
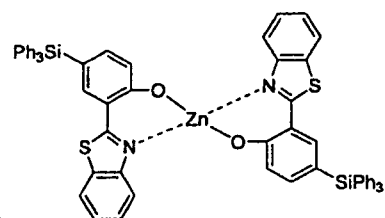
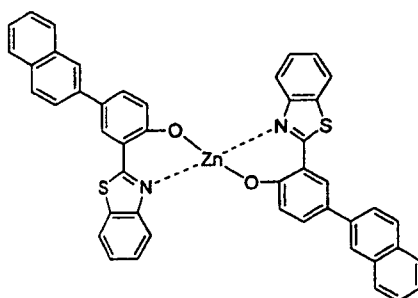
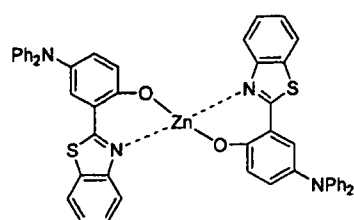
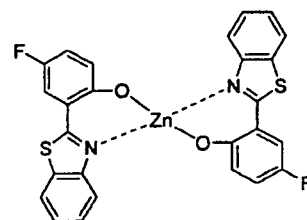
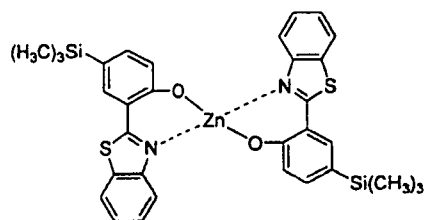
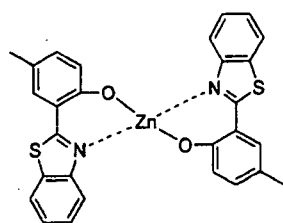
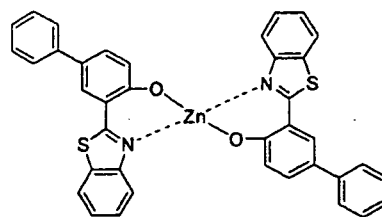
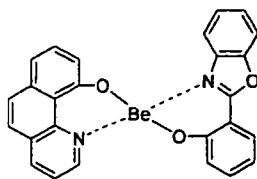
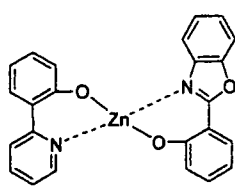


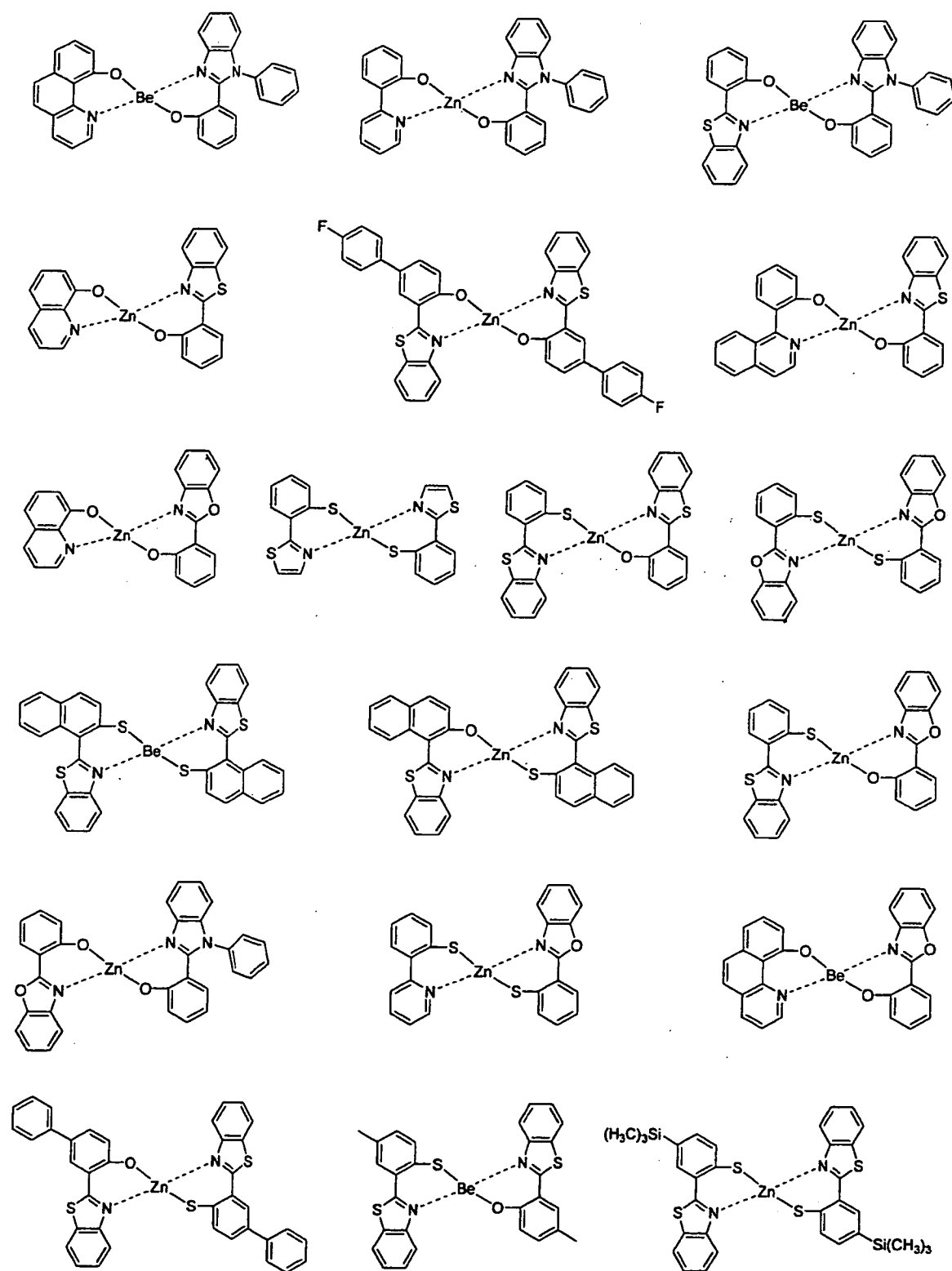


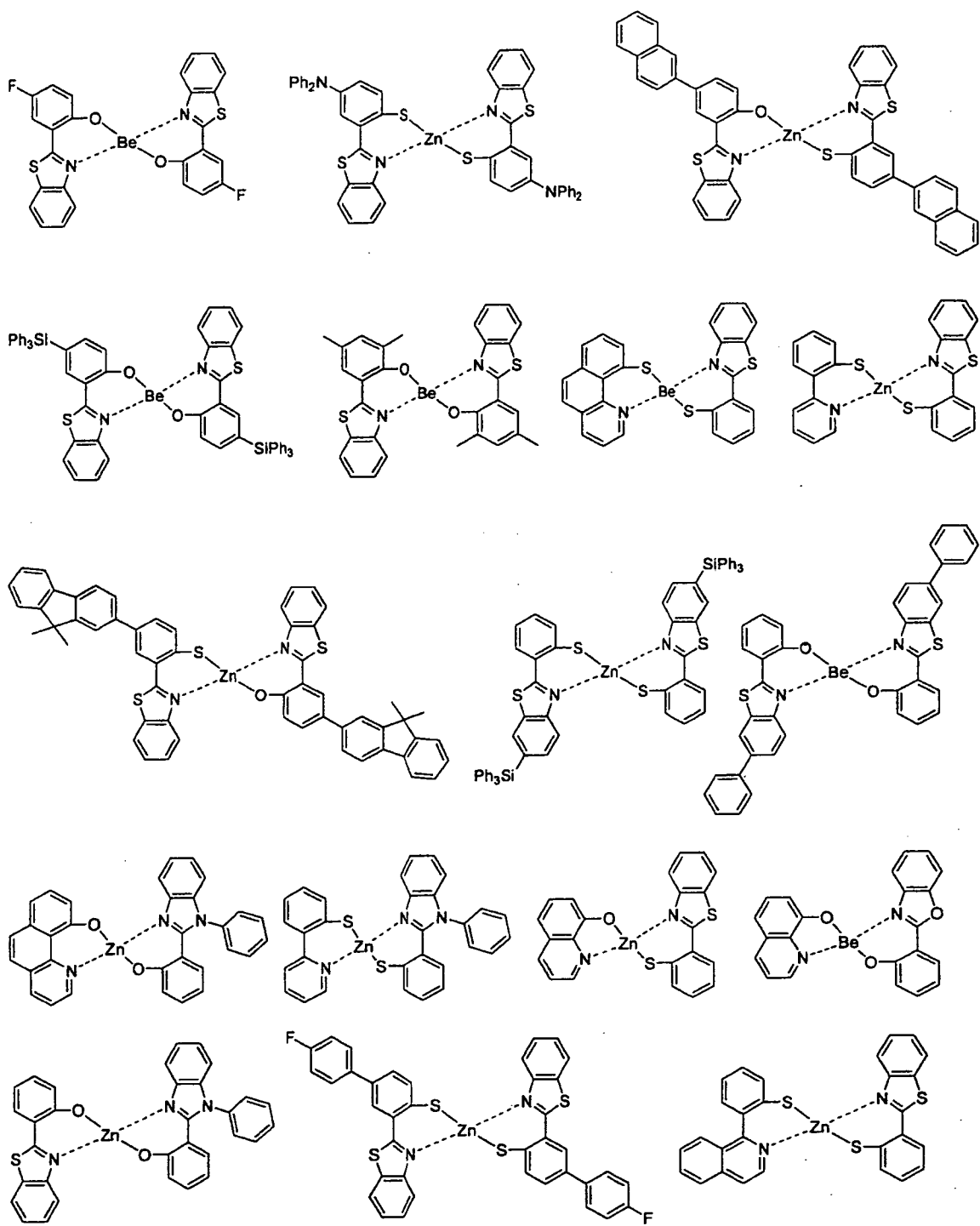


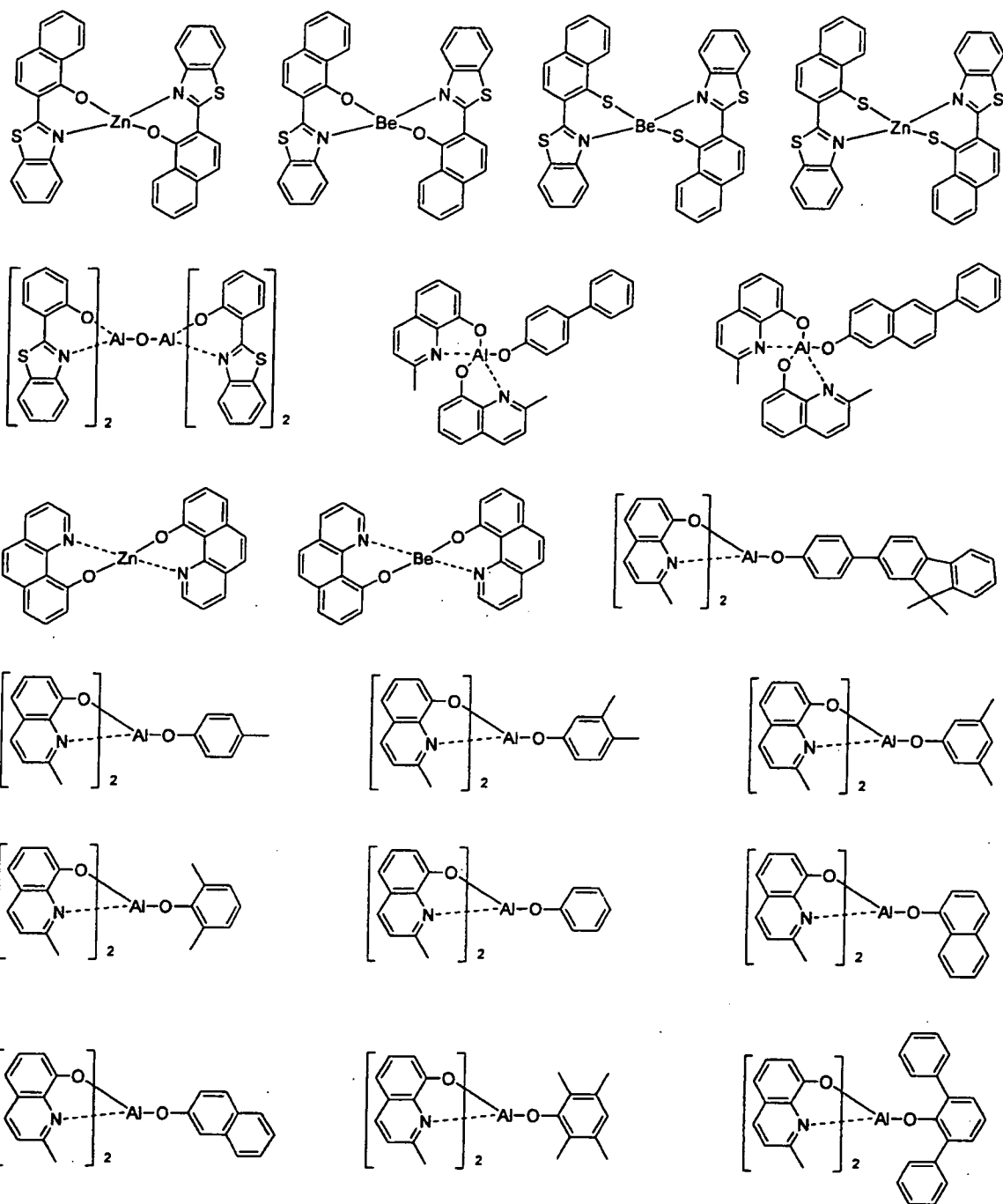


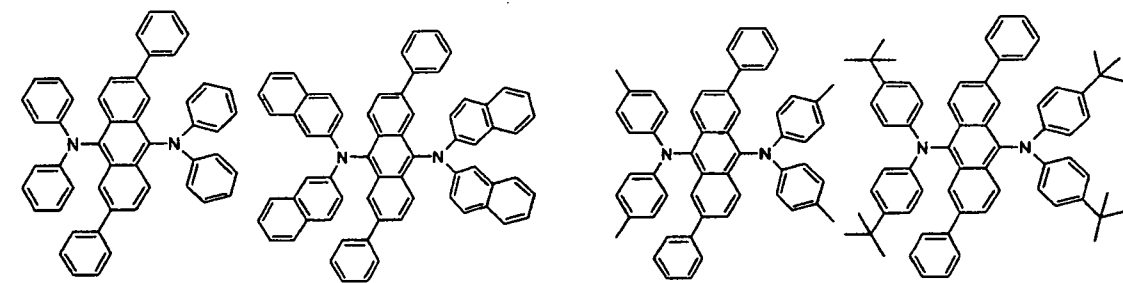


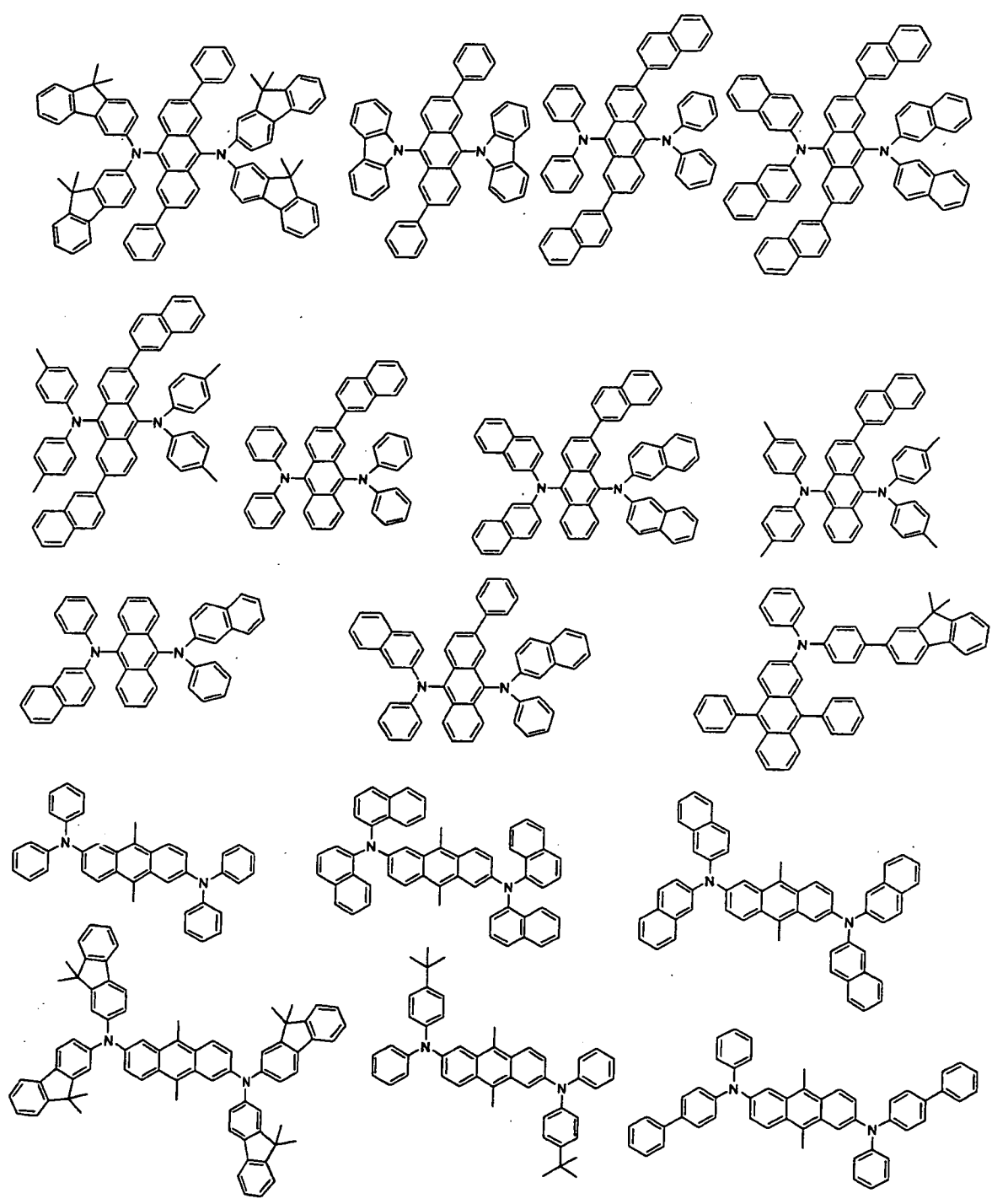


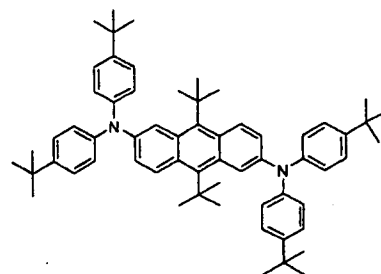
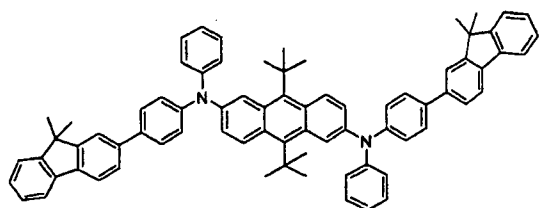
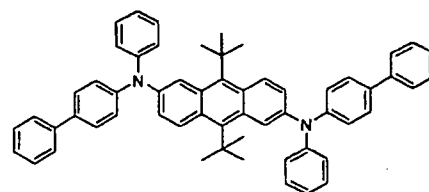
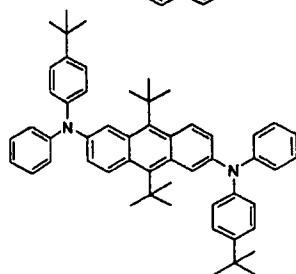
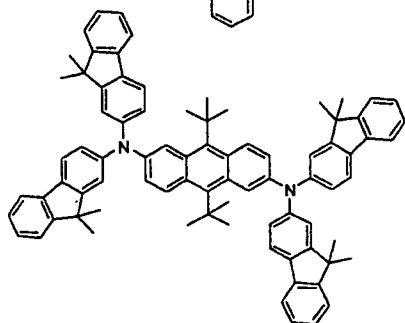
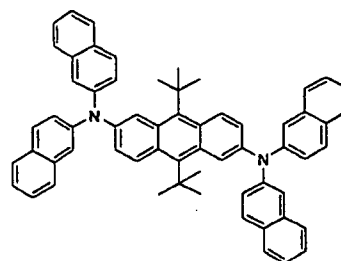
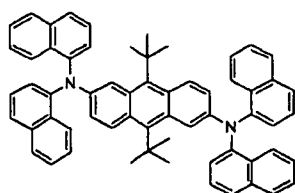
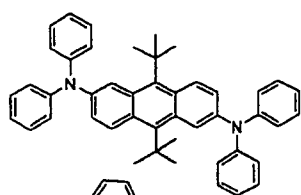
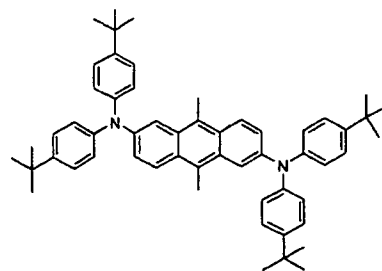
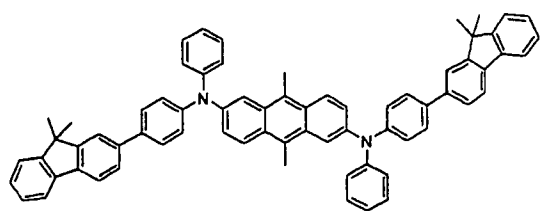


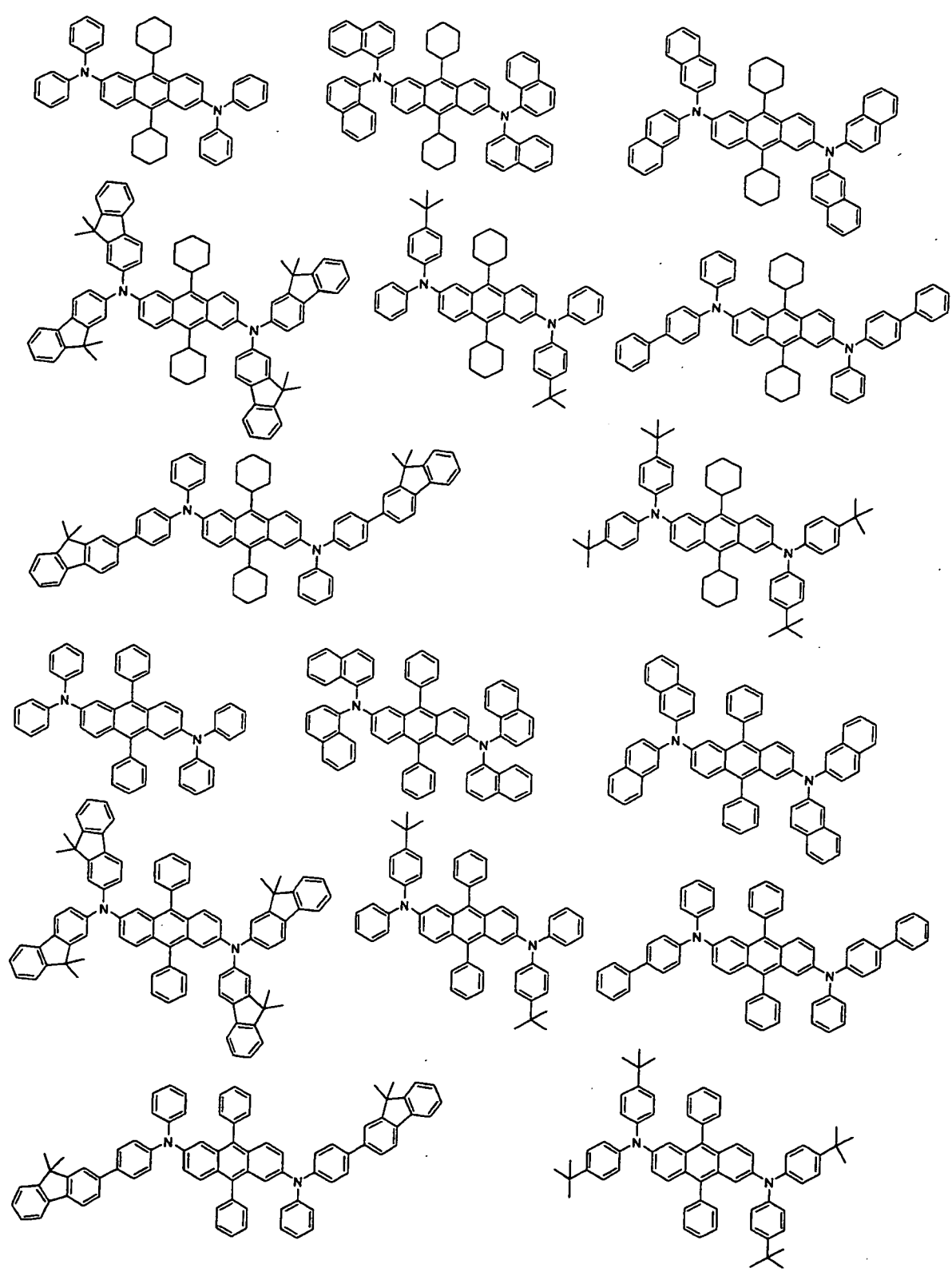


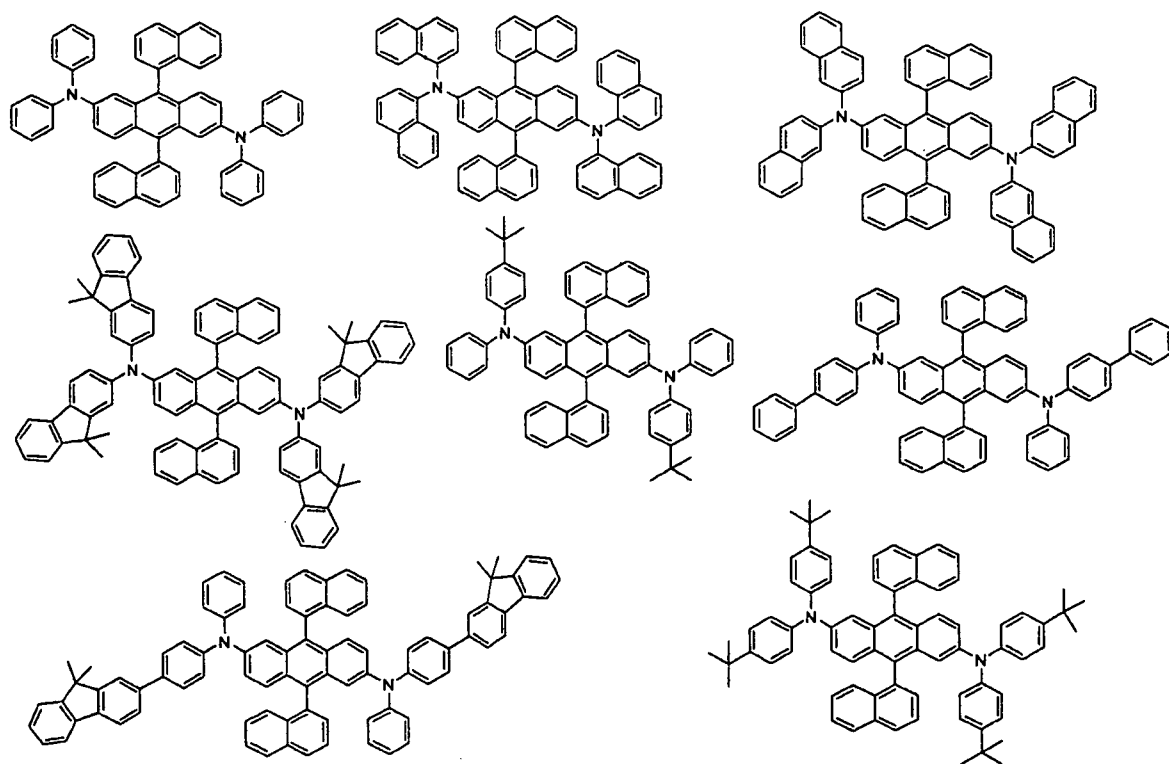


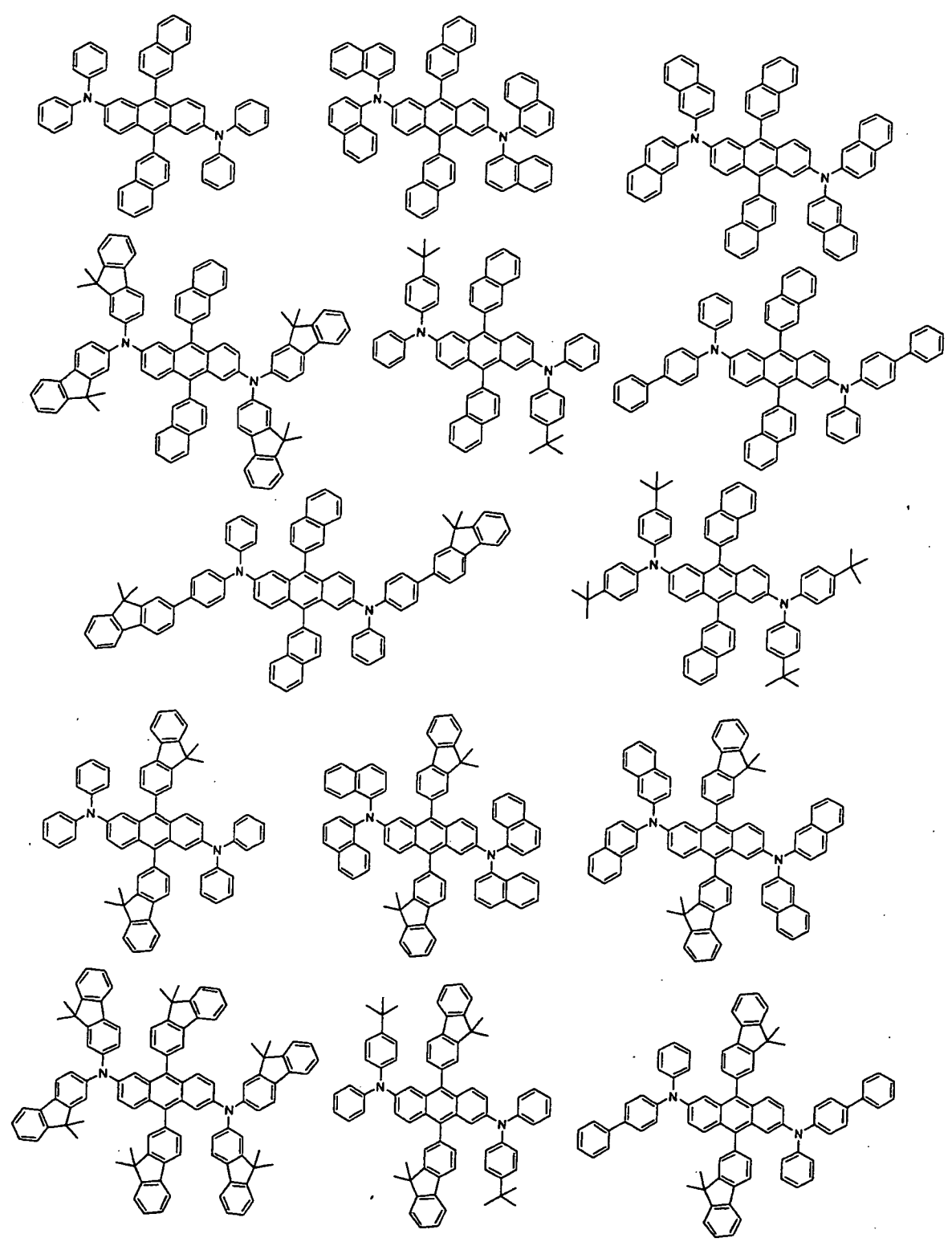


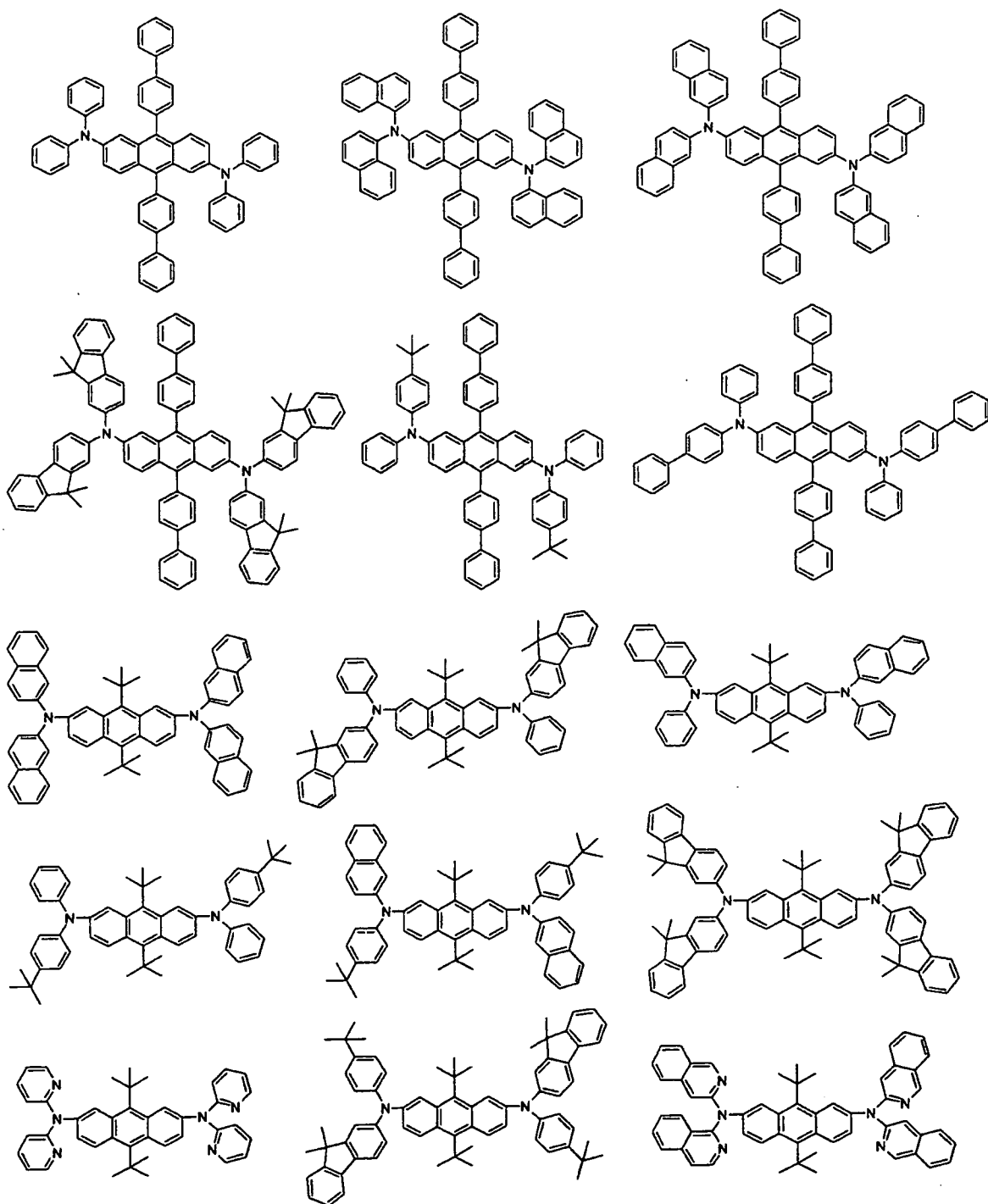


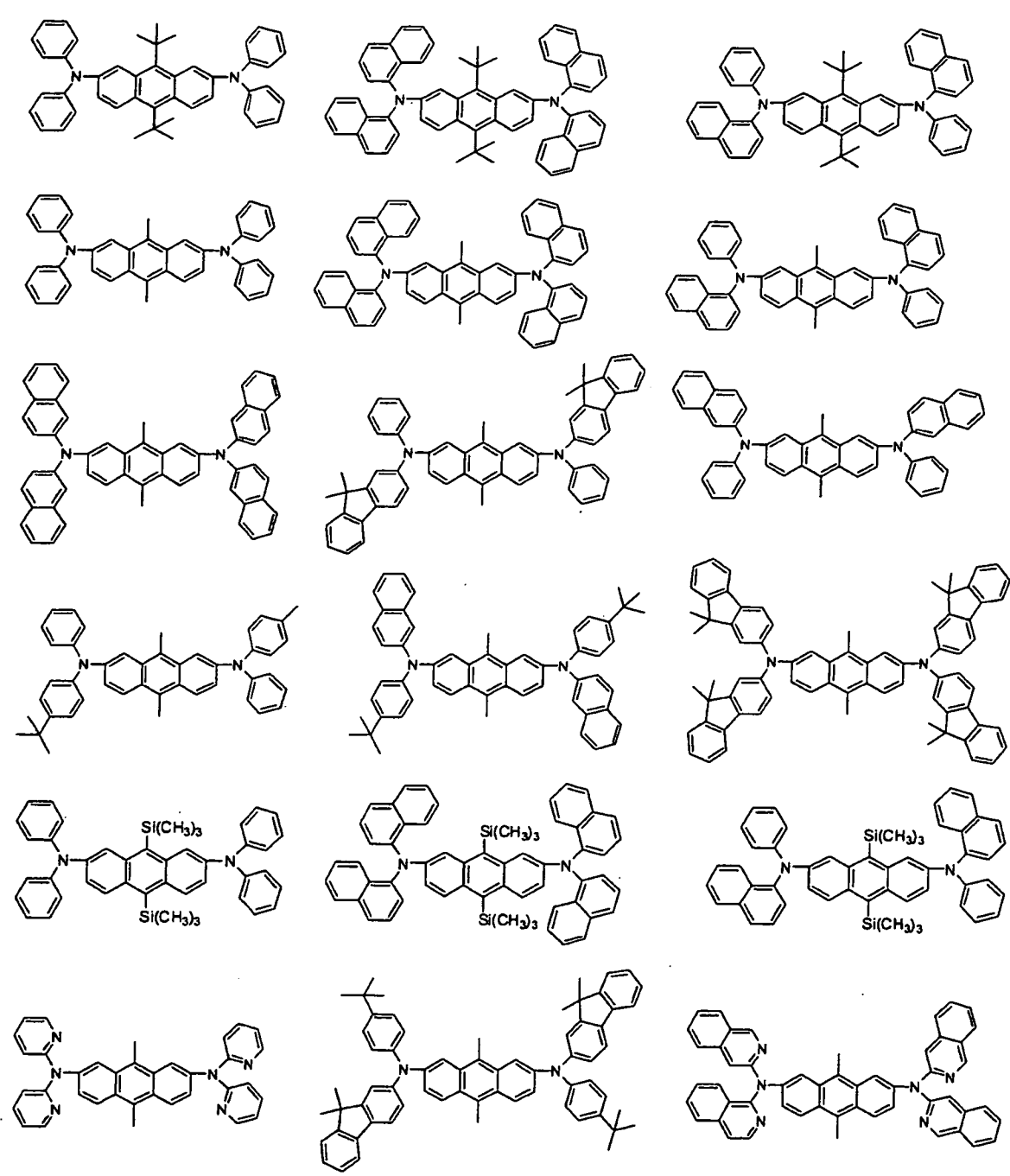


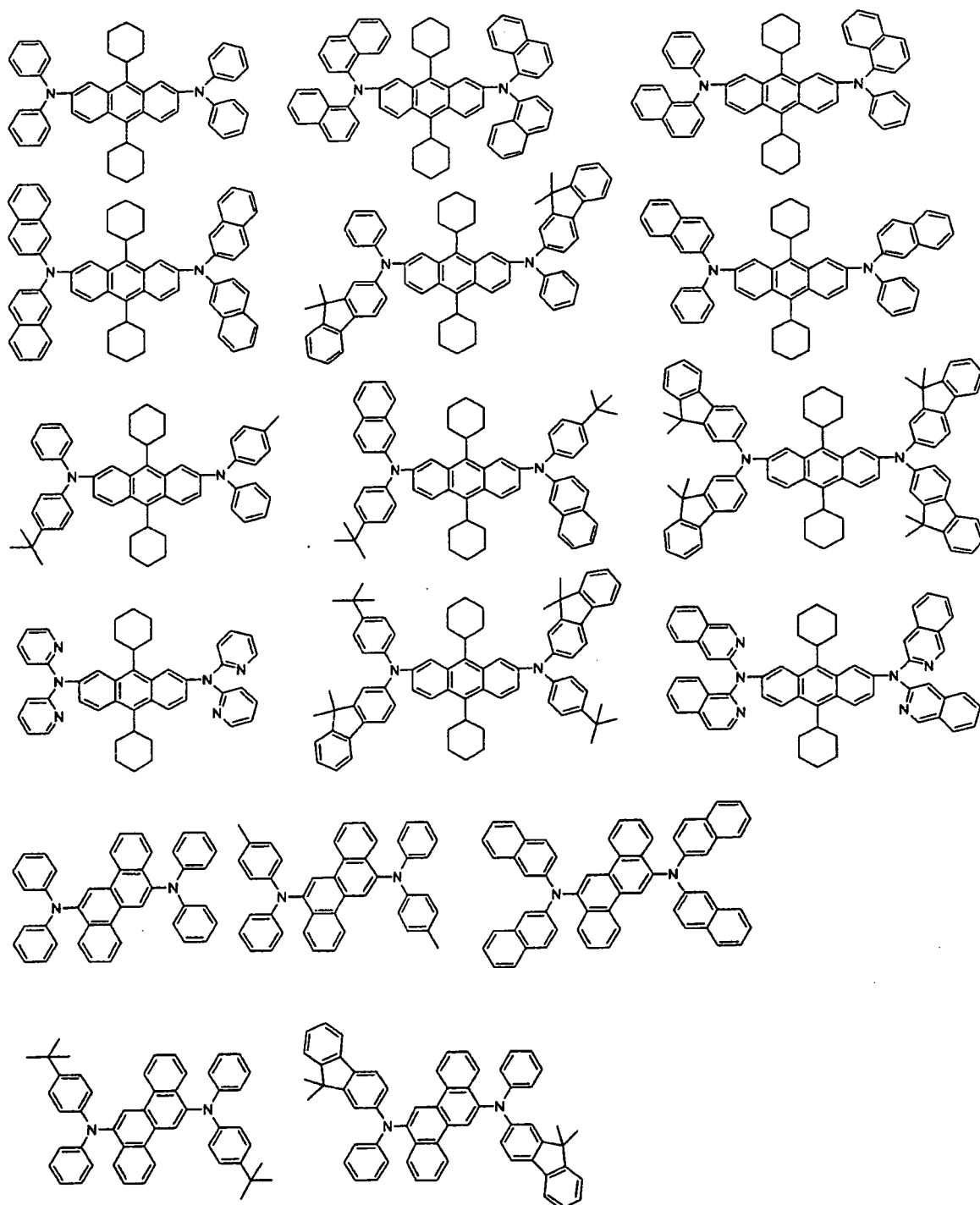


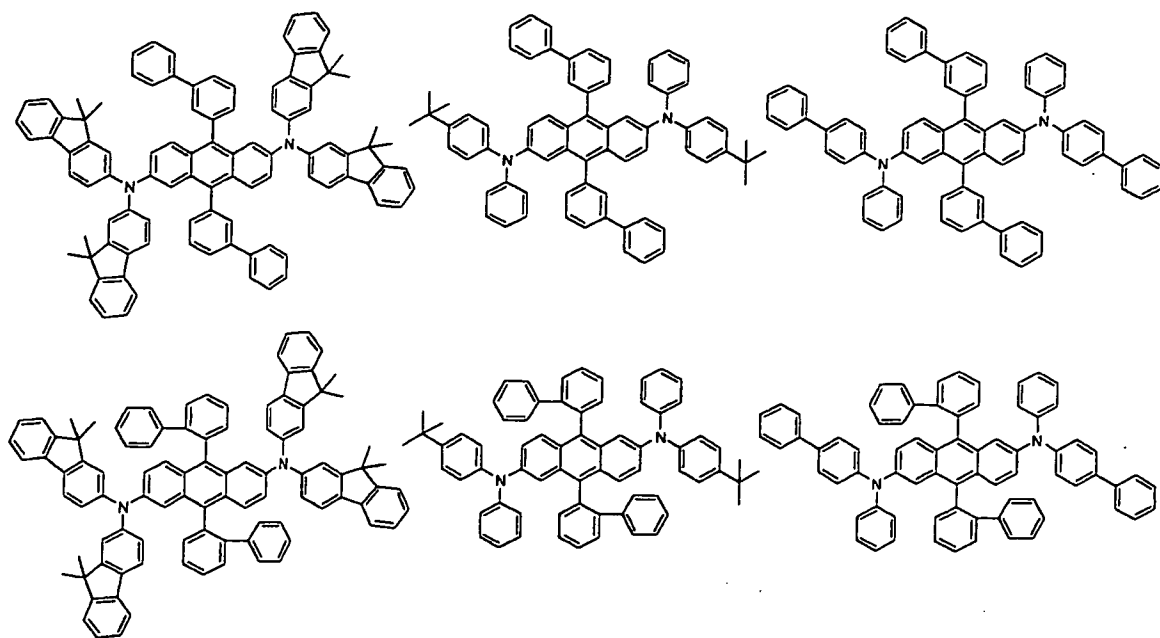












於根據本發明之電致發光裝置中，較佳係將一層或多層(後文中稱為「表面層」)選自硫族化合物(chalcogenide)層、金屬鹵化物層及金屬氧化物層之層體置於成對電極之至少一側的內表面上。具體而言，較佳係將矽與鋁金屬(包括氧化物)之硫族化合物層設置於 EL 介質層之陽極表面上，並將金屬鹵化物層或金屬氧化物層設置於 EL 介質層之陰極表面上。藉此，可得到操作安定性。

硫族化合物之實例較佳係包括 SiO_x ($1 \leq x \leq 2$)、 AlO_x ($1 \leq x \leq 1.5$)、 SiON 、 SiAlON 等。鹵化金屬之實例較佳係包括 LiF 、 MgF_2 、 CaF_2 、稀土金屬之氟化物等。氧化金屬之實例較佳係包括 Cs_2O 、 Li_2O 、 MgO 、 SrO 、 BaO 、 CaO 等。

於根據本發明之電致發光裝置中，亦較佳為將電子傳輸化合物與還原性摻雜物之混合區、或電洞傳輸化合物與氧化性摻雜物之混合區設置於如是製得之電極對的至少一個表面上。藉此，電子傳輸化合物被還原成陰離子，因而

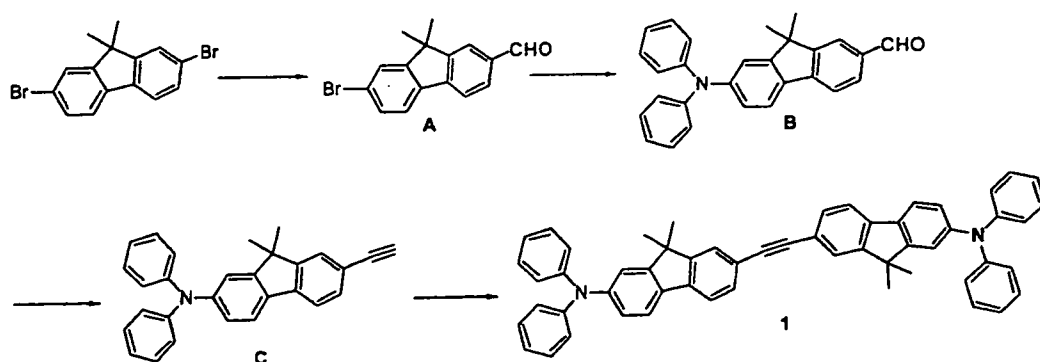
促使電子自混合區注入與傳輸至 EL 介質。此外，由於電洞傳輸化合物被氧化而形成陽離子，因此促使電洞自混合區注入與傳輸至 EL 介質。較佳之氧化性摻雜物包含各種路易斯酸及接受者化合物(acceptor compound)。較佳之還原性摻雜物包含鹼金屬、鹼金屬化合物、鹼土金屬、稀土金屬及其混合物。

具有高藍色發光效率及優異的材料壽命性能之根據本發明之有機電致發光化合物係利於被運用來製造具有優異操作壽命之有機發光二極體(OLED)。

本發明係藉由參照與本發明之有機電致發光化合物相關的代表性化合物、其製備及從之製得的裝置的發光性能以進一步說明本發明之有機電致發光化合物，但提供這些例子係為了較佳地瞭解本發明及說明具體實施例而已，非意欲以任何形式限制本發明之範圍。

製備例

[製備例 1]化合物(1)的合成



製備化合物(A)

將 2,6-二溴萸(53.0 公克(g), 0.15 莫耳(mol))溶於

四氫呋喃(350 毫升(mL))中，並於 -78°C 緩慢逐滴添加正丁基鋰(1.6 莫耳濃度(M)於正己烷中)(63.2 mL, 158 毫莫耳(mmol))。攪拌 30 分鐘後，添加 N,N-二甲基甲醯胺(16.3 mL, 211 mmol)至混合物中。緩慢升溫且攪拌反應混合物 2 小時。添加 NH_4Cl 水溶液(20 mL)及蒸餾水(20 mL)以終止反應後，單離有機層，並於減壓下蒸發之。以甲醇：正己烷(1/1, v/v)(100 mL)將殘質再結晶而獲得化合物(A)(20.9 g, 69.4 mmol)。

製備化合物(B)

將上述獲得之醛化合物(A)(20.9 g, 69.4 mmol)與二苯胺(12.5 g, 104.1 mmol)、碳酸鉍(24.1 g, 104.1 mmol)及醋酸鈀($\text{Pd}(\text{OAc})_2$)(332 毫克(mg), 2.1 mmol)懸浮於甲苯(800 mL)中。添加三(第三丁基)膦($\text{P}(\text{t-Bu})_3$)(0.60 g, 4.2 mmol)後，於 120°C 攪拌所得混合物 4 小時。添加飽和氯化銨水溶液(30 mL)，且以乙酸乙酯(50 mL)萃取混合物並過濾。以甲醇：正己烷(1/1, v/v)(50 mL)再結晶以獲得化合物(B)(15.2 g, 39.0 mmol)。

製備化合物(C)

將三苯基膦(50 g, 190.6 mmol)溶於二氯甲烷(260 mL)中，且在 10 分鐘期間緩慢加入四溴甲烷(CBr_4)(31.6 g, 95.3 mmol)溶液。於室溫下攪拌混合物至溶液變為深褐色，且緩慢加入水(40 mL)以終止反應。萃取混合物，且於減壓下乾燥萃取物以獲得固體。將固體添加至甲醇中並於回流下攪拌。濾除不溶固體，且於減壓下蒸發濾液。以乙

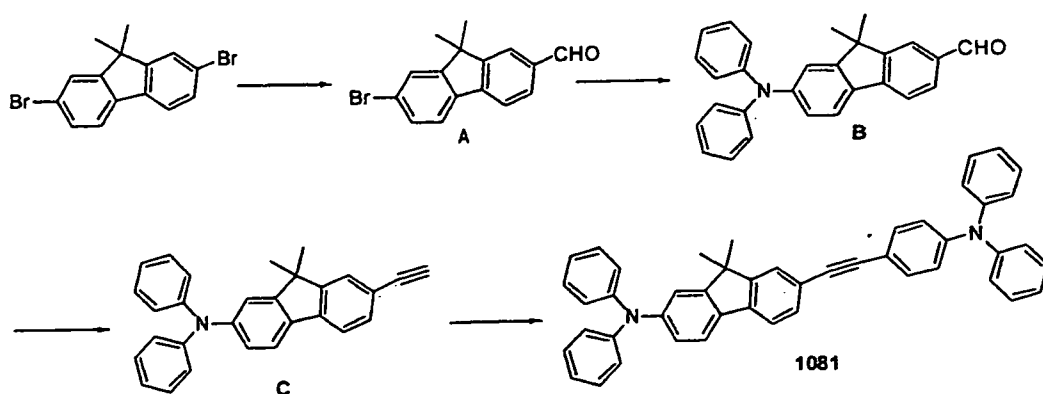
酸乙酯/甲醇再結晶而獲得磷錯合物(45 g, 75%)。

將獲得之磷錯合物(19.8 g, 38.5 mmol)及第三丁氧化鉀($\text{KOC}(\text{CH}_3)_3$)(4.3 g, 38.5 mmol)溶於四氫呋喃(250 mL)中，且加入化合物(B)(5 g, 12.8 mmol)。於室溫攪拌 10 分鐘後，加入第三丁氧化鉀($\text{KOC}(\text{CH}_3)_3$)(11.5 g, 102.7 mmol)，且於室溫下攪拌混合物 2 小時。當反應結束時，使用水及醚萃取反應混合物，並於減壓下乾燥。以管柱層析法純化而獲得化合物(C)(1.9 g, 38%)。

製備化合物(1)

將化合物(C)(10g, 25.9mmol)、7-溴-9,9-二甲基-N,N-二苯基-9H-芴-2-胺(12.7g, 28.8mmol)、 $\text{Pd}(\text{dba})_2$ (0.2 g, 0.4 mmol)、三苯基磷(0.8 g, 2.9 mmol)及碘化銅(I)(CuI)(0.5 g, 2.6 mmol)溶於三乙胺(260 mL)中，於回流下攪拌溶液 24 小時。當反應結束時，冷卻反應混合物至室溫，且使用二氯甲烷及水萃取，並於減壓下乾燥萃取物。以管柱層析法純化而獲得化合物(1)(16 g, 72%)。

[製備例 2] 製備化合物(1081)



製備化合物(A)

將 2,6-二溴萸(53.0 g, 0.15 mol)溶於四氫呋喃(350 mL)中，並於 -78°C 緩慢逐滴添加正丁基鋰(1.6 M 於正己烷中)(63.2 mL, 158 mmol)。攪拌 30 分鐘後，加入 N,N-二甲基甲醯胺(16.3 mL, 211 mmol)。緩慢升溫並持續攪拌 2 小時。之後，添加 NH_4Cl 水溶液(20 mL)及蒸餾水(20 mL)以終止反應後。單離有機層，並於減壓下蒸發之。以甲醇：正己烷(1/1, v/v)(100 mL)將殘質再結晶而獲得化合物(A)(20.9 g, 69.4 mmol)。

製備化合物(B)

將上述獲得之醛化合物(A)(20.9 g, 69.4 mmol)與二苯胺(12.5 g, 104.1 mmol)、碳酸銨(24.1 g, 104.1 mmol)及醋酸鈀($\text{Pd}(\text{OAc})_2$)(332 mg, 2.1 mmol)懸浮於甲苯(800 mL)中。加入三(第三丁基)膦($\text{P}(\text{t-Bu})_3$)(0.60 g, 4.2 mmol)後，且於 120°C 下攪拌所得混合物 4 小時。加入飽和氯化銨水溶液(30 mL)，以乙酸乙酯(50 mL)萃取混合物並過濾。以甲醇：正己烷(1/1, v/v)(50 mL)再結晶以獲得化合物(B)(15.2 g, 39.0 mmol)。

製備化合物(C)

將三苯基膦(50 g, 190.6 mmol)溶於二氯甲烷(260 mL)中，且於 10 分鐘期間緩慢添加四溴甲烷(CBr_4)(31.6 g, 95.3 mmol)溶液。於室溫攪拌混合物至溶液變為深褐色，且緩慢加入水(40 mL)以終止反應。萃取混合物，且於減壓下乾燥萃取物以獲得固體。將固體添加至甲醇中並於回流下攪拌。濾除不溶固體，且於減壓下蒸發濾液。以乙酸乙

酯/甲醇再結晶而獲得磷錯合物(45 g, 75%)。

將獲得之磷錯合物(19.8 g, 38.5 mmol)及第三丁氧化鉀($\text{KOC}(\text{CH}_3)_3$)(4.3 g, 38.5 mmol)溶於四氫呋喃(250 mL)中，且加入化合物(B)(5 g, 12.8 mmol)。於室溫攪拌 10 分鐘後，加入第三丁氧化鉀($\text{KOC}(\text{CH}_3)_3$)(11.5 g, 102.7 mmol)，且於室溫下攪拌混合物 2 小時。當反應結束時，使用水及醚萃取反應混合物，並於減壓下乾燥。以管柱層析法純化而獲得化合物(C)(1.9 g, 38%)。

製備化合物(1081)

將 N-(4-溴苯基)-N-苯基苯胺(0.9 g, 2.9 mmol)、 Pd_2dba_3 (12 mg, 0.013 mmol)、三(第三丁基)膦($6.4 \mu\text{L}$)(0.013 mmol, 50 重量%於甲苯中)及三乙胺(0.5 mL, 3.9 mmol)溶於四氫呋喃(30 mL)中。攪拌溶液 5 分鐘後，加入化合物(C)(1 g, 2.6 mmol)，且於回流下攪拌所得混合物 12 小時。當反應結束時，冷卻反應混合物至室溫，且使用二氯甲烷及水萃取。於減壓下乾燥萃取物，並以管柱層析法純化而獲得化合物(1081)(0.96 g, 59%)。

根據與製備例 1 及製備例 2 相同之程序，製備列於表 1 之有機電致發光化合物(化合物 1 至化合物 2771)，其中之 ^1H NMR 及 MS/FAB 數據列於表 2。

表 1

Ar₅ Ar₆ N Ar₁ Ar₂ N Ar₃ Ar₄						
編號	Ar ₁	Ar ₂	Ar ₃	Ar ₄	Ar ₅	Ar ₆
1						
2						
3						
4						
5						
6						
7						
8						
9						

10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						

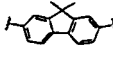
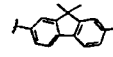
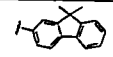
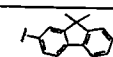
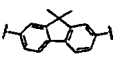
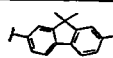
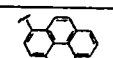
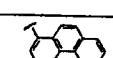
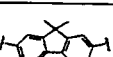
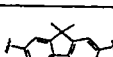
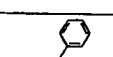
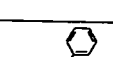
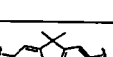
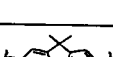
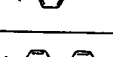
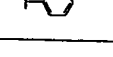
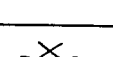
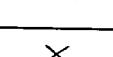
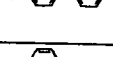
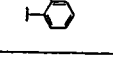
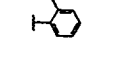
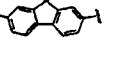
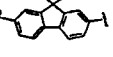
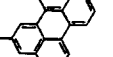
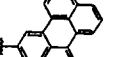
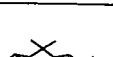
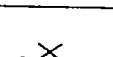
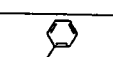
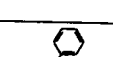
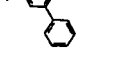
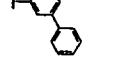
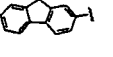
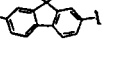
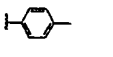
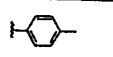
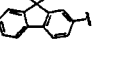
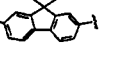
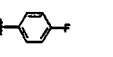
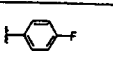
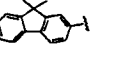
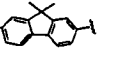
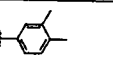
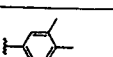
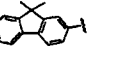
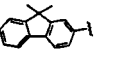
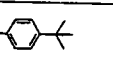
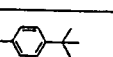
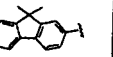
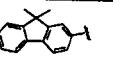
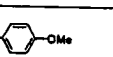
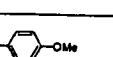
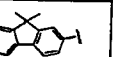
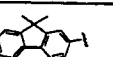
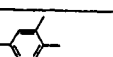
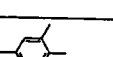
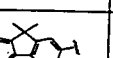
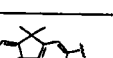
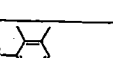
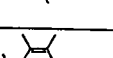
27						
28						
29						
30						
31						
32						
33						
34						
35						
36						
37						
38						
39						
40						
41						
42						
43						

44						
45						
46						
47						
48						
49						
50						
51						
52						
53						
54						
55						
56						
57						
58						
59						

60						
61						
62						
63						
64						
65						
66						
67						
68						
69						
70						
71						
72						
73						
74						
75						
76						

77						
78						
79						
80						
81						
82						
83						
84						
85						
86						
87						
88						
89						
90						
91						
92						
93						



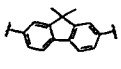
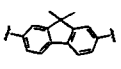
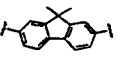
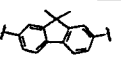
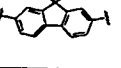
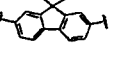
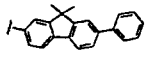
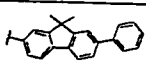
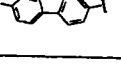
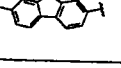
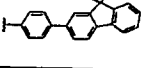
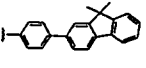
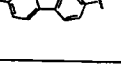
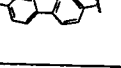
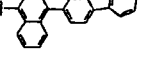
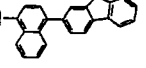
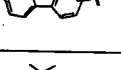
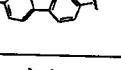
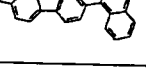
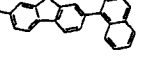
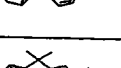
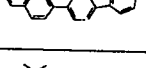
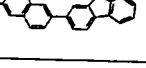
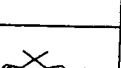
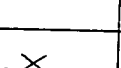
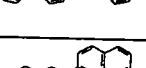
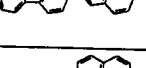
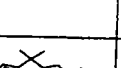
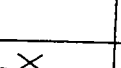
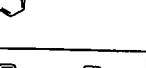
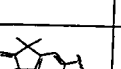
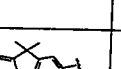
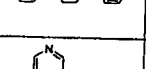
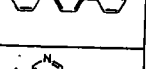
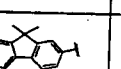
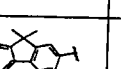
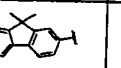
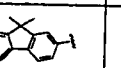
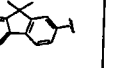
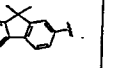
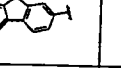
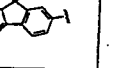
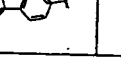
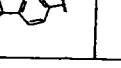
94						
95						
96						
97						
98						
99						
100						
101						
102						
103						
104						
105						
106						
107						
108						
109						

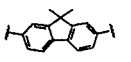
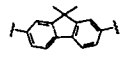
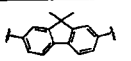
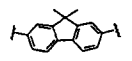
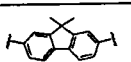
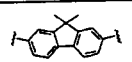
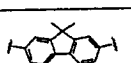
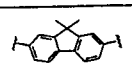
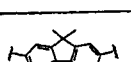
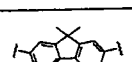
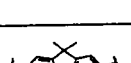
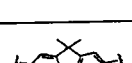
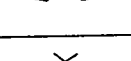
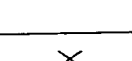
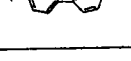
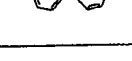
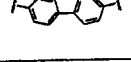
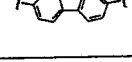
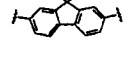
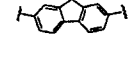
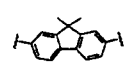
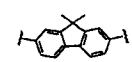
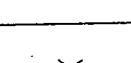
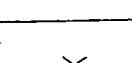
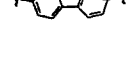
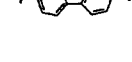
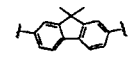
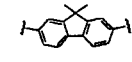
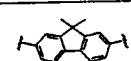
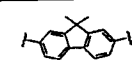
110						
111						
112						
113						
114						
115						
116						
117						
118						
119						
120						
121						
122						
123						
124						
125						
126						



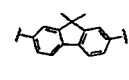
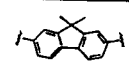
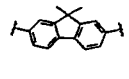
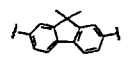
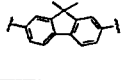
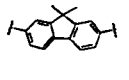
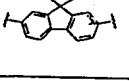
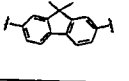
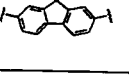
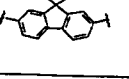
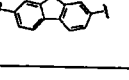
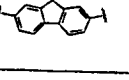
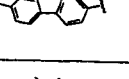
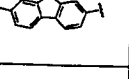
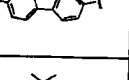
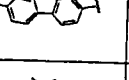
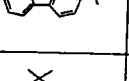
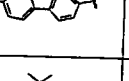
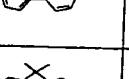
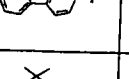
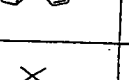
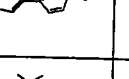
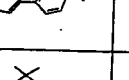
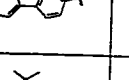
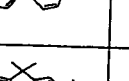
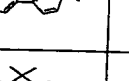
127						
128						
129						
130						
131						
132						
133						
134						
135						
136						
137						
138						
139						
140						
141						
142						

143						
144						
145						
146						
147						
148						
149						
150						
151						
152						
153						
154						
155						
156						
157						
158						

159						
160						
161						
162						
163						
164						
165						
166						
167						
168						
169						
170						
171						
172						
173						
174						

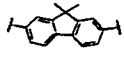
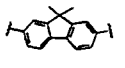
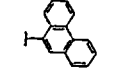
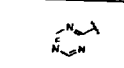
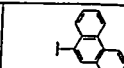
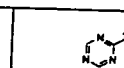
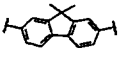
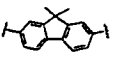
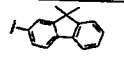
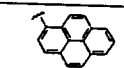
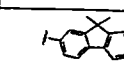
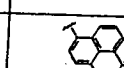
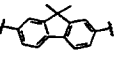
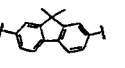
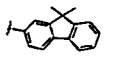
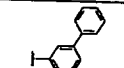
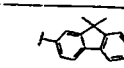
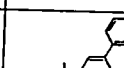
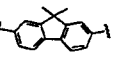
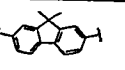
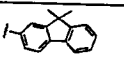
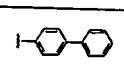
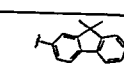
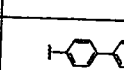
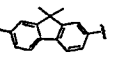
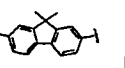
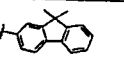
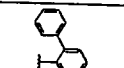
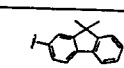
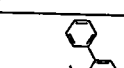
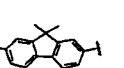
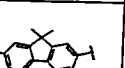
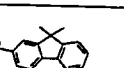
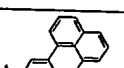
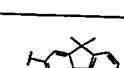
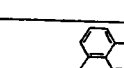
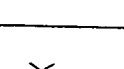
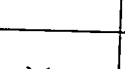
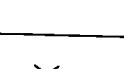
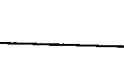
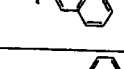
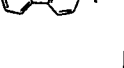
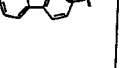
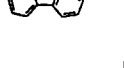
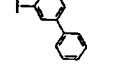
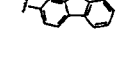
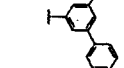
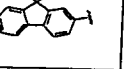
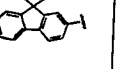
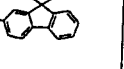
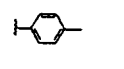
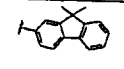
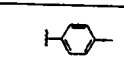
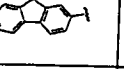
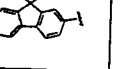
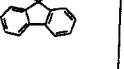
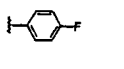
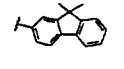
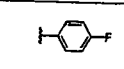
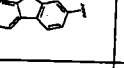
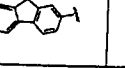
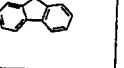
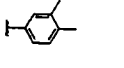
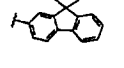
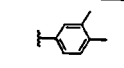
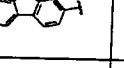
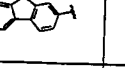
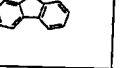
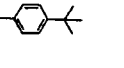
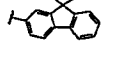
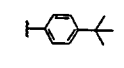
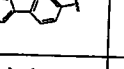
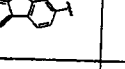
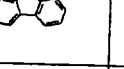
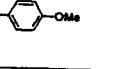
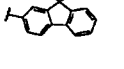
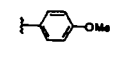
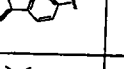
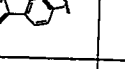
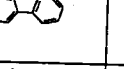
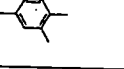
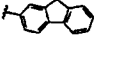
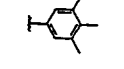
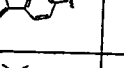
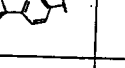
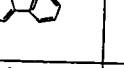
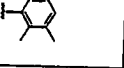
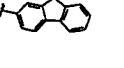
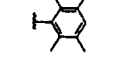
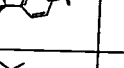
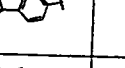
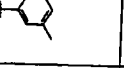
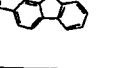
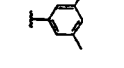
175						
176						
177						
178						
179						
180						
181						
182						
183						
184						
185						
186						
187						
188						
189						

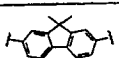
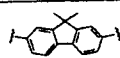
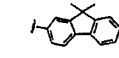
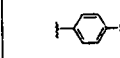
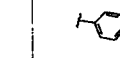
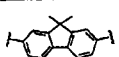
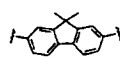
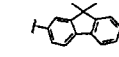
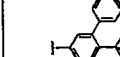
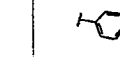
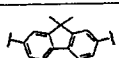
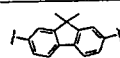
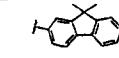
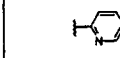
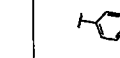
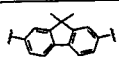
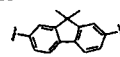
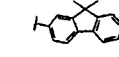
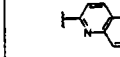
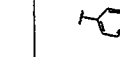
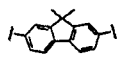
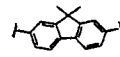
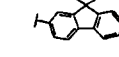
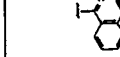
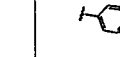
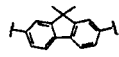
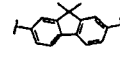
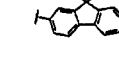
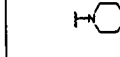
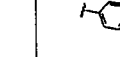
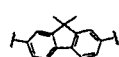
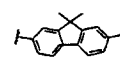
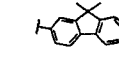
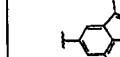
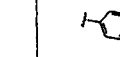
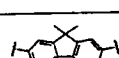
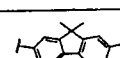
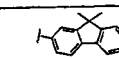
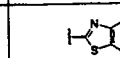
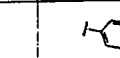
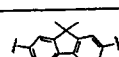
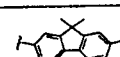
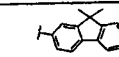
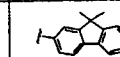
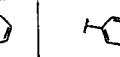
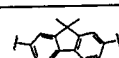
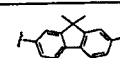
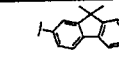
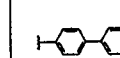
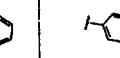
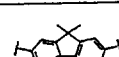
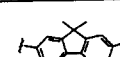
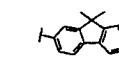
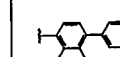
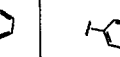
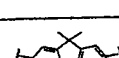
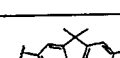
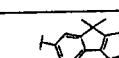
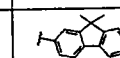
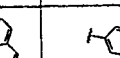
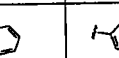
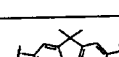
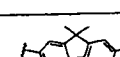
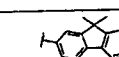
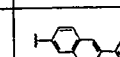
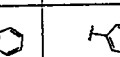
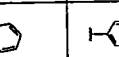
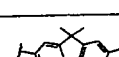
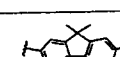
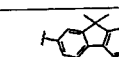
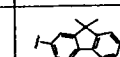
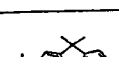
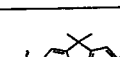
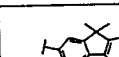
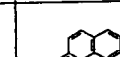
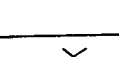
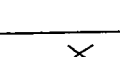
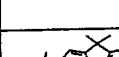
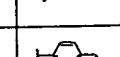
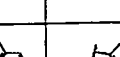


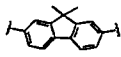
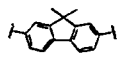
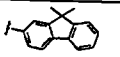
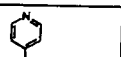
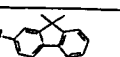
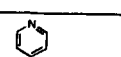
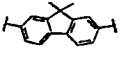
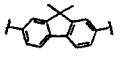
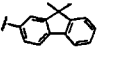
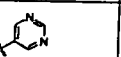
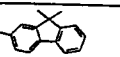
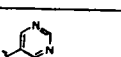
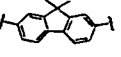
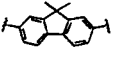
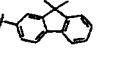
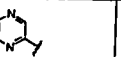
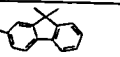
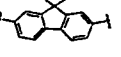
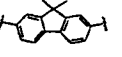
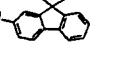
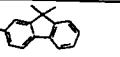
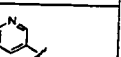
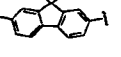
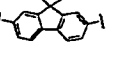
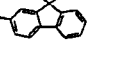
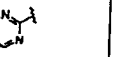
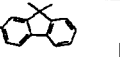
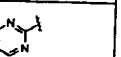
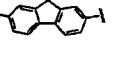
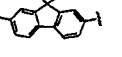
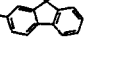
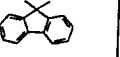
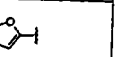
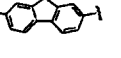
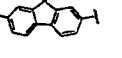
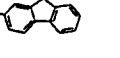
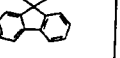
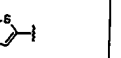
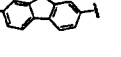
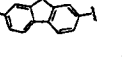
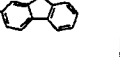
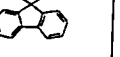
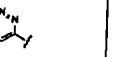
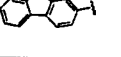
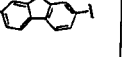
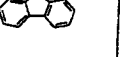
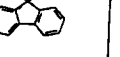
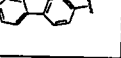
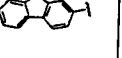
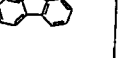
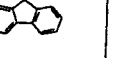
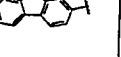
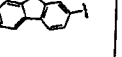
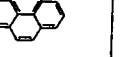
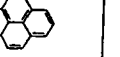
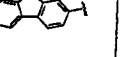
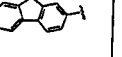
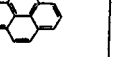
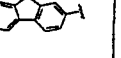
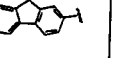
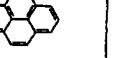
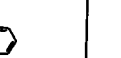
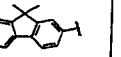
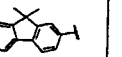
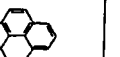
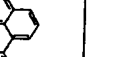
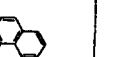
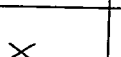
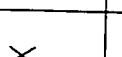
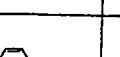
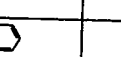
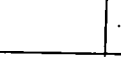
190						
191						
192						
193						
194						
195						
196						
197						
198						
199						
200						
201						
202						
203						
204						

205						
206						
207						
208						
209						
210						
211						
212						
213						
214						
215						
216						
217						
218						
219						

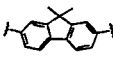
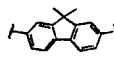
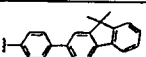
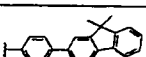
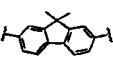
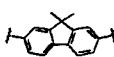
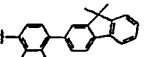
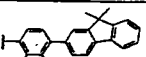
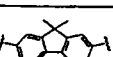
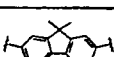
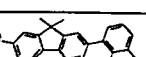
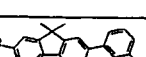
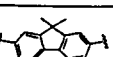
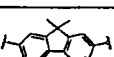
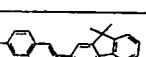
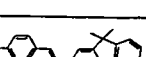
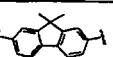
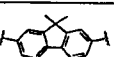
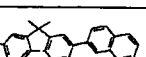
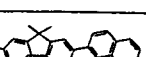
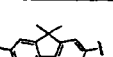
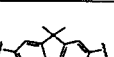
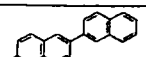
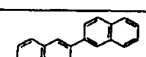
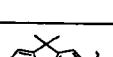
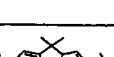
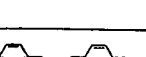
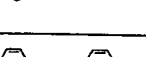
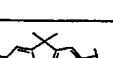
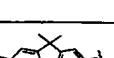
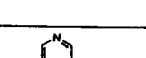
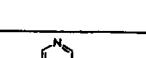
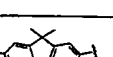
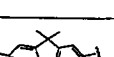
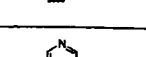
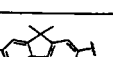
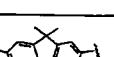
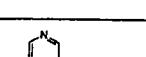
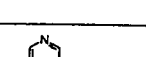
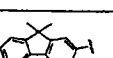
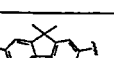
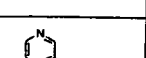
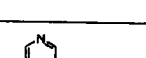
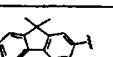
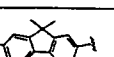
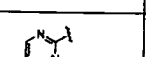
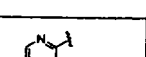
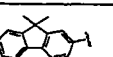
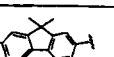
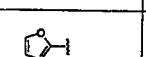
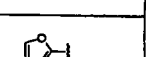
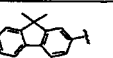
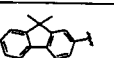
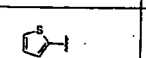
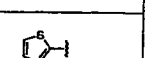
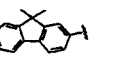
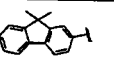
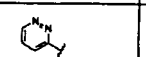
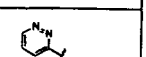
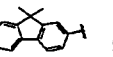
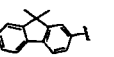
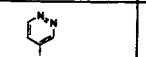
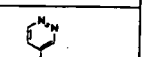
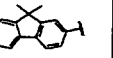
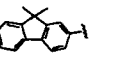
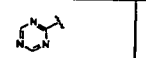
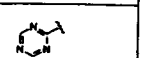


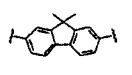
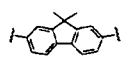
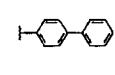
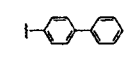
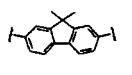
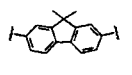
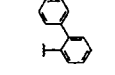
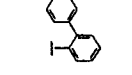
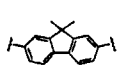
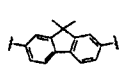
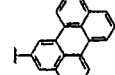
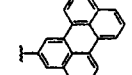
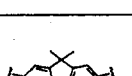
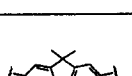
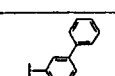
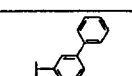
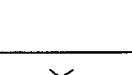
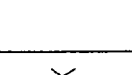
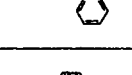
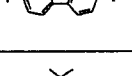
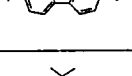
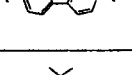
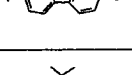
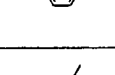
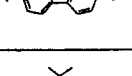
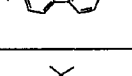
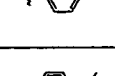
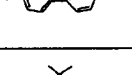
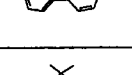
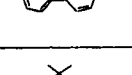
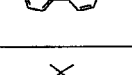
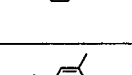
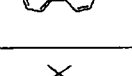
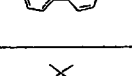
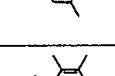
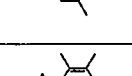
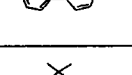
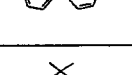
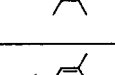
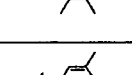
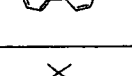
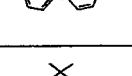
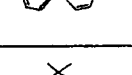
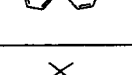
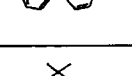
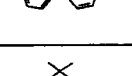
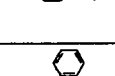
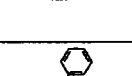
220						
221						
222						
223						
224						
225						
226						
227						
228						
229						
230						
231						
232						
233						
234						
235						

236						
237						
238						
239						
240						
241						
242						
243						
244						
245						
246						
247						
248						
249						
250						
251						

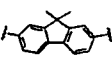
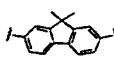
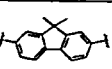
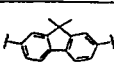
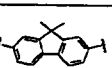
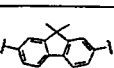
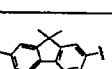
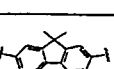
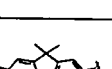
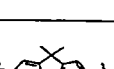
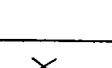
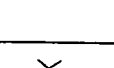
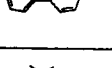
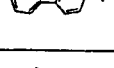
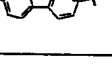
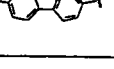
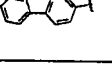
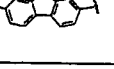
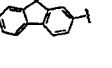
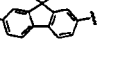
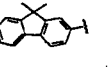
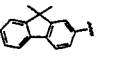
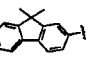
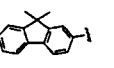
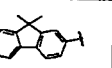
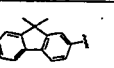
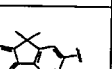
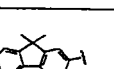
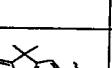
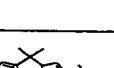
252						
253						
254						
255						
256						
257						
258						
259						
260						
261						
262						
263						
264						
265						
266						
267						

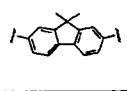
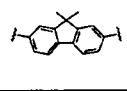
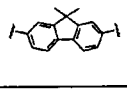
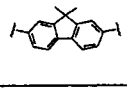
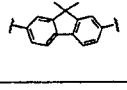
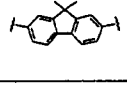
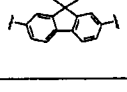
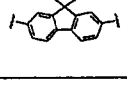
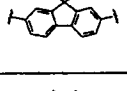
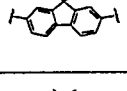
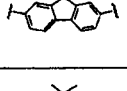
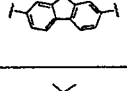
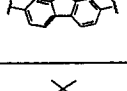
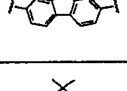
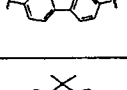
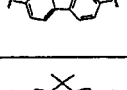
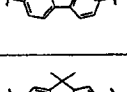
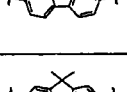
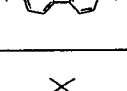
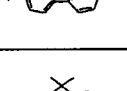
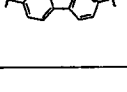
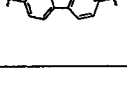
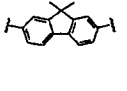
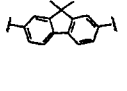
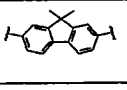
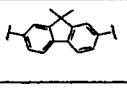
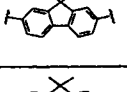
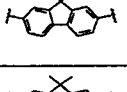
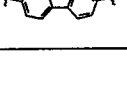
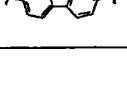
268						
269						
270						
271						
272						
273						
274						
275						
276						
277						
278						
279						
280						
281						
282						
283						
284						

285						
286						
287						
288						
289						
290						
291						
292						
293						
294						
295						
296						
297						
298						
299						
300						
301						

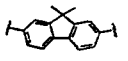
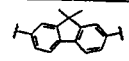
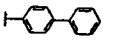
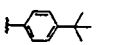
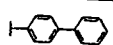
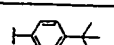
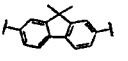
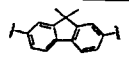
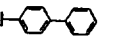
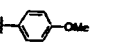
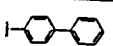
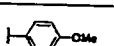
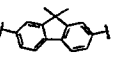
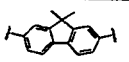
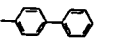
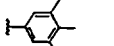
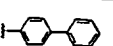
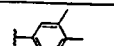
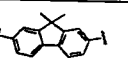
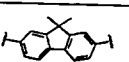
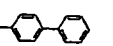
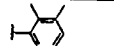
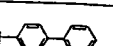
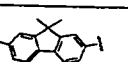
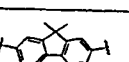
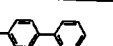
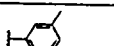
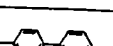
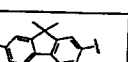
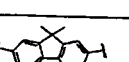
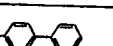
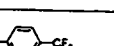
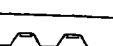
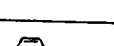
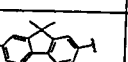
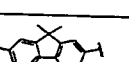
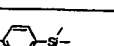
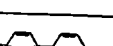
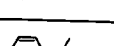
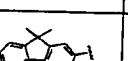
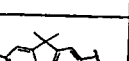
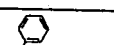
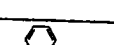
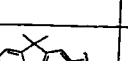
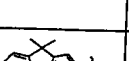
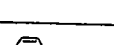
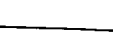
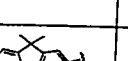
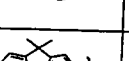
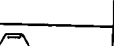
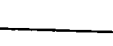
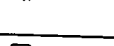
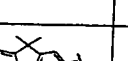
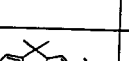
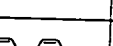
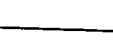
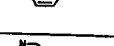
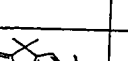
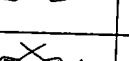
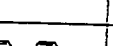
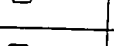
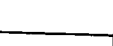
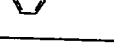
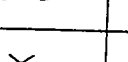
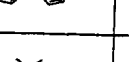
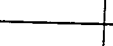
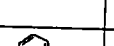
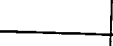
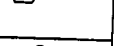
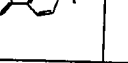
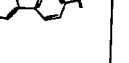
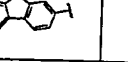
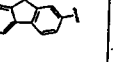
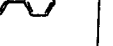
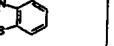
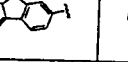
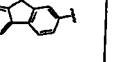
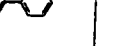
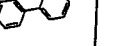
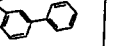
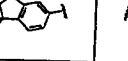
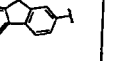
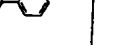
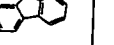
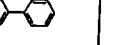
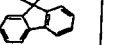
302						
303						
304						
305						
306						
307						
308						
309						
310						
311						
312						
313						
314						
315						
316						



317						
318						
319						
320						
321						
322						
323						
324						
325						
326						
327						
328						
329						
330						
331						

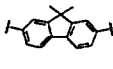
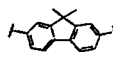
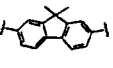
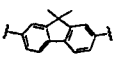
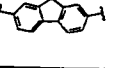
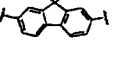
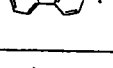
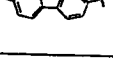
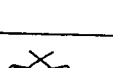
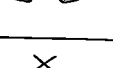
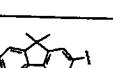
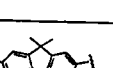
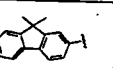
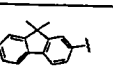
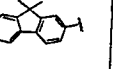
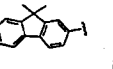
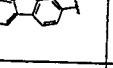
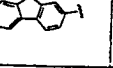
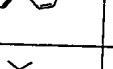
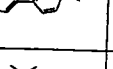
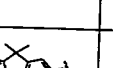
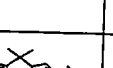
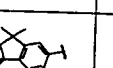
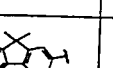
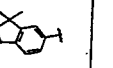
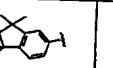
332						
333						
334						
335						
336						
337						
338						
339						
340						
341						
342						
343						
344						
345						
346						



347						
348						
349						
350						
351						
352						
353						
354						
355						
356						
357						
358						
359						
360						
361						
362						
363						

364						
365						
366						
367						
368						
369						
370						
371						
372						
373						
374						
375						
376						
377						
378						
379						



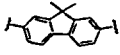
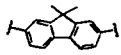
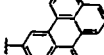
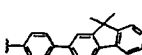
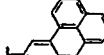
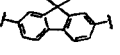
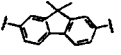
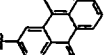
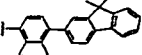
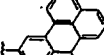
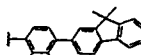
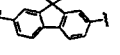
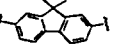
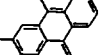
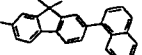
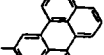
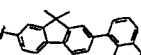
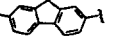
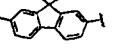
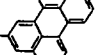
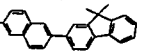
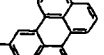
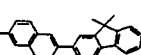
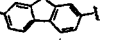
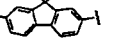
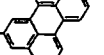
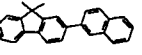
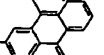
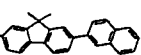
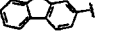
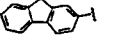
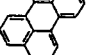
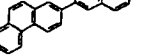
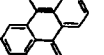
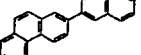
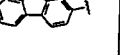
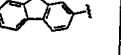
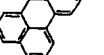
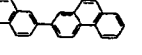
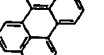
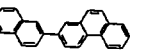
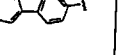
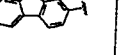
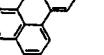
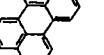
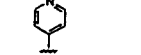
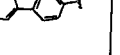
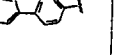
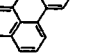
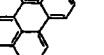
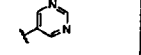
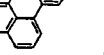
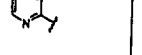
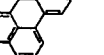
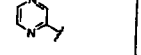
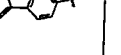
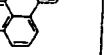
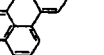
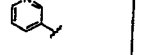
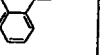
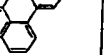
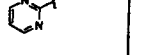
380						
381						
382						
383						
384						
385						
386						
387						
388						
389						
390						
391						
392						
393						
394						

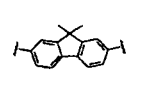
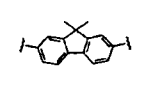
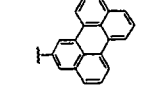
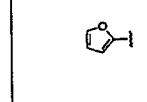
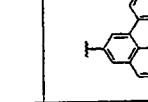
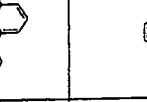
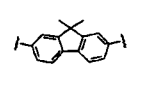
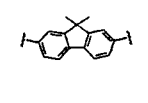
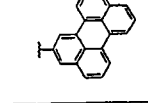
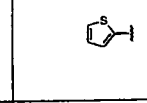
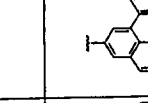
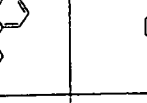
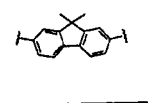
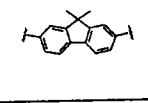
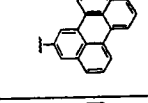
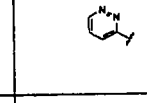
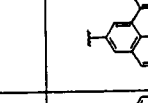
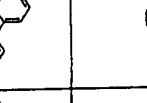
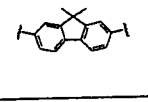
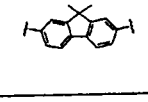
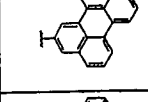
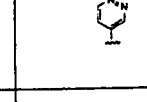
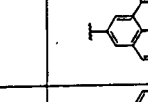
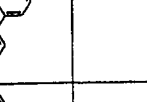
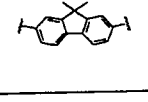
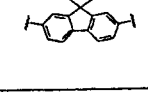
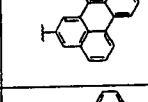
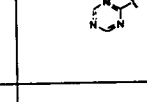
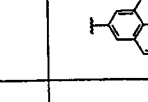
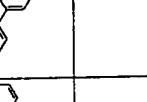
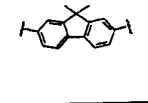
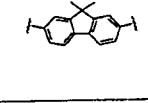
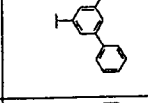
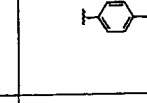
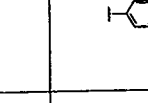
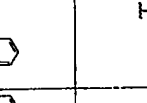
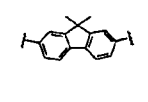
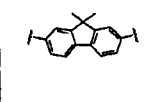
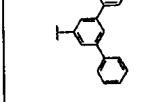
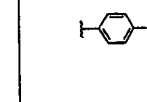
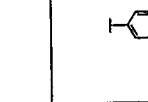
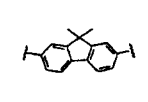
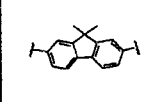
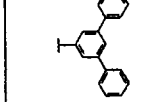
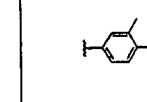
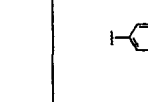
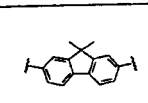
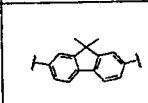
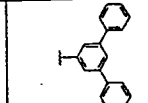
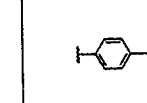
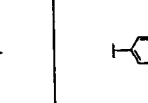
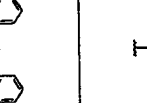
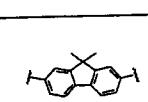
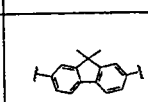
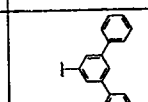
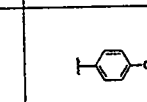
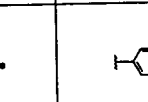
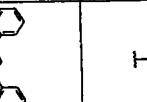
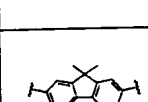
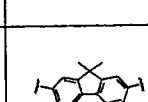
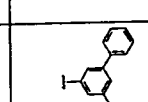
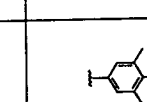
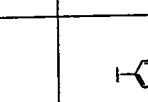
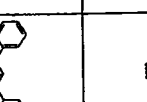
395						
396						
397						
398						
399						
400						
401						
402						
403						
404						
405						
406						
407						
408						
409						



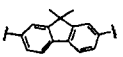
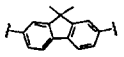
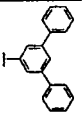
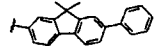
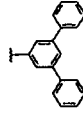
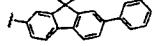
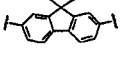
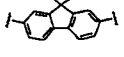
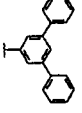
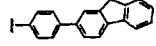
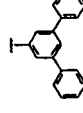
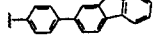
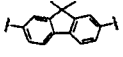
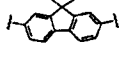
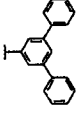
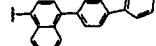
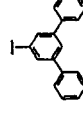
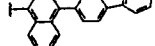
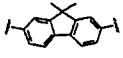
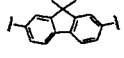
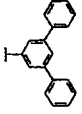
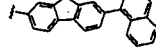
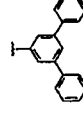
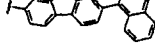
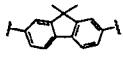
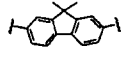
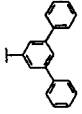
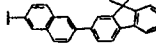
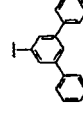
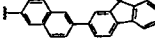
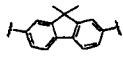
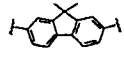
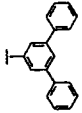
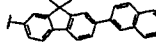
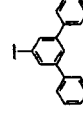
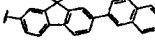
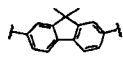
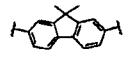
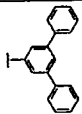
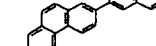
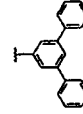
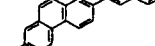
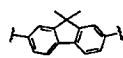
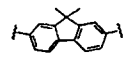
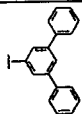
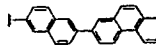
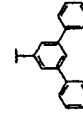
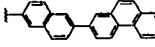
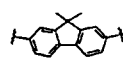
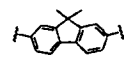
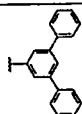
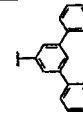
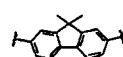
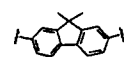
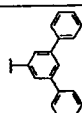
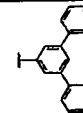
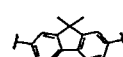
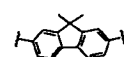
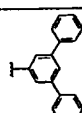
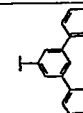
410						
411						
412						
413						
414						
415						
416						
417						
418						
419						
420						
421						
422						

423						
424						
425						
426						
427						
428						
429						
430						
431						
432						
433						
434						

435						
436						
437						
438						
439						
440						
441						
442						
443						
444						
445						
446						

447						
448						
449						
450						
451						
452						
453						
454						
455						
456						
457						

458						
459						
460						
461						
462						
463						
464						
465						
466						
467						
468						

469						
470						
471						
472						
473						
474						
475						
476						
477						
478						
479						

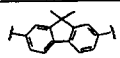
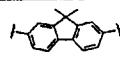
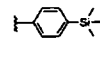
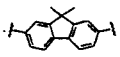
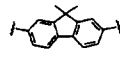
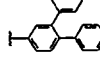
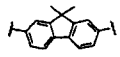
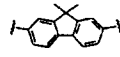
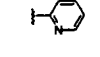
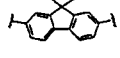
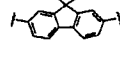
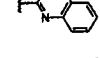
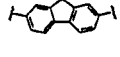
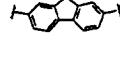
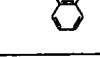
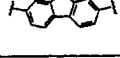
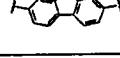
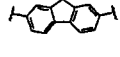
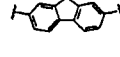
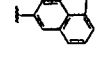
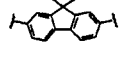
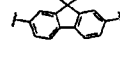
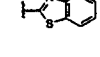
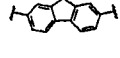
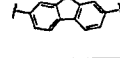
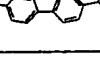
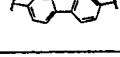
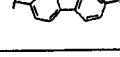
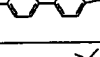
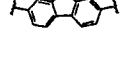
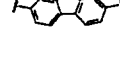
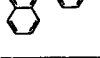
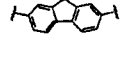
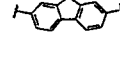
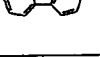
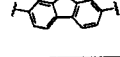
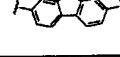
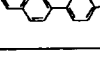
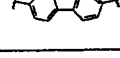
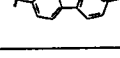
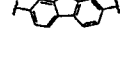
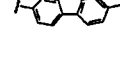
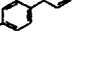
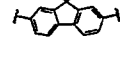
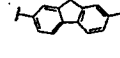
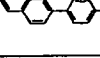
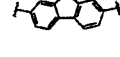
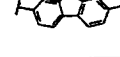


480						
481						
482						
483						
484						
485						
486						
487						
488						
489						
490						
491						
492						

493						
494						
495						
496						
497						
498						
499						
500						
501						
502						
503						
504						
505						
506						
507						
508						
509						

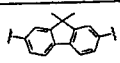
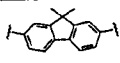
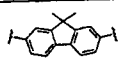
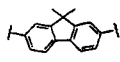
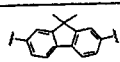
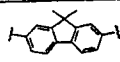
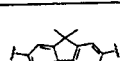
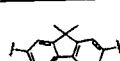
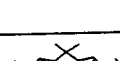
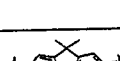
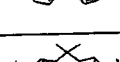
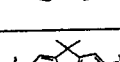
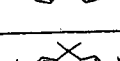
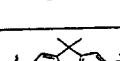
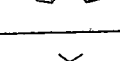
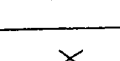
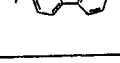
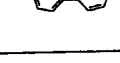
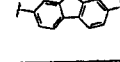
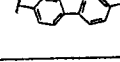
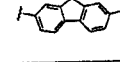
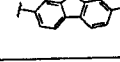
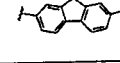
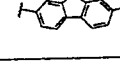
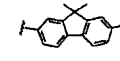
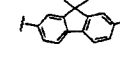
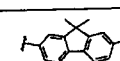
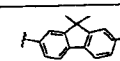
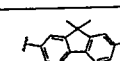
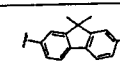
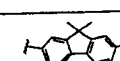
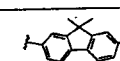
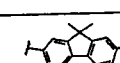
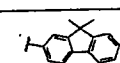


510						
511						
512						
513						
514						
515						
516						
517						
518						
519						
520						
521						
522						
523						
524						
525						
526						
527						

528						
529						
530						
531						
532						
533						
534						
535						
536						
537						
538						
539						
540						
541						
542						
543						
544						



545						
546						
547						
548						
549						
550						
551						
552						
553						
554						
555						
556						
557						
558						
559						
560						
561						
562						

563						
564						
565						
566						
567						
568						
569						
570						
571						
572						
573						
574						
575						
576						
577						
578						
579						

580						
581						
582						
583						
584						
585						
586						
587						
588						
589						
590						
591						
592						
593						
594						
595						
596						

597						
598						
599						
600						
601						
602						
603						
604						
605						
606						
607						
608						
609						
610						
611						
612						
613						

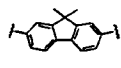
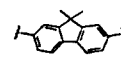
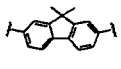
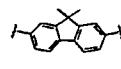
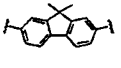
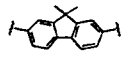
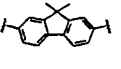
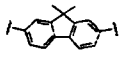
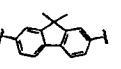
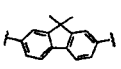
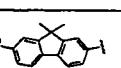
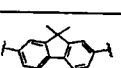
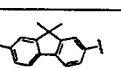
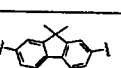
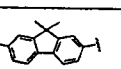
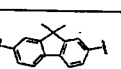
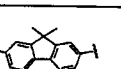
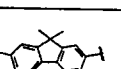
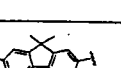
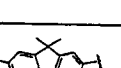
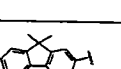
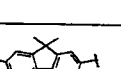
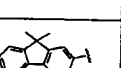
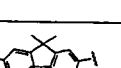
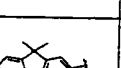
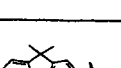
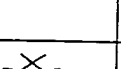
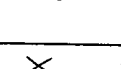
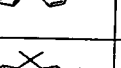
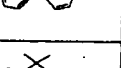
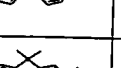
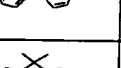


614						
615						
616						
617						
618						
619						
620						
621						
622						
623						
624						
625						
626						
627						
628						
629						
630						

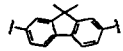
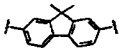
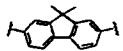
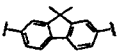
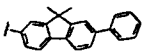
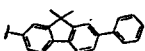
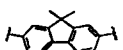
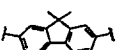
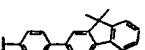
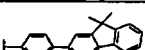
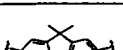
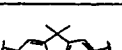
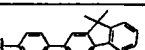
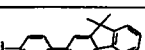
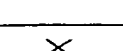
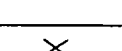
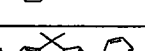
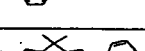
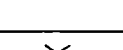
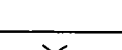
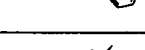
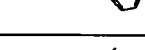
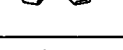
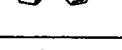
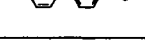
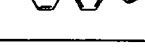
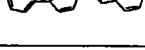
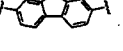
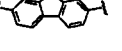
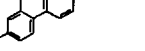
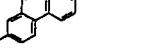
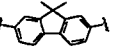
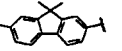
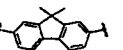
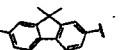
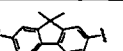
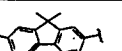
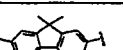
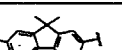
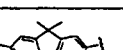
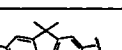
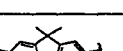
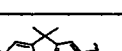
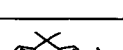
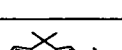
631						
632						
633						
634						
635						
636						
637						
638						
639						
640						
641						
642						
643						
644						
645						
646						
647						

648						
649						
650						
651						
652						
653						
654						
655						
656						
657						
658						
659						
660						
661						
662						
663						

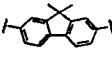
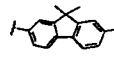
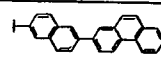
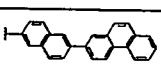
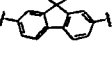
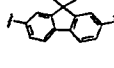
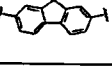
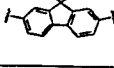
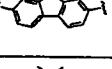
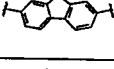
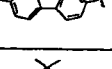
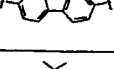
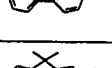
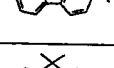
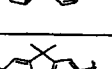
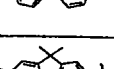
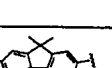
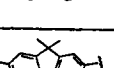
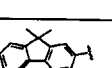
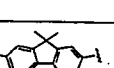
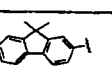
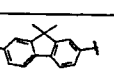
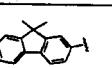
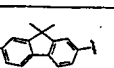
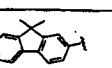
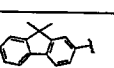
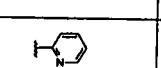
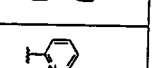
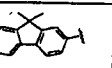
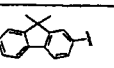
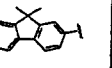
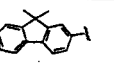
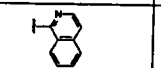
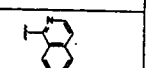
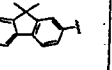
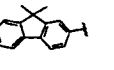
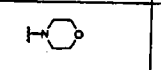
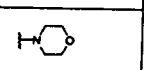
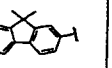
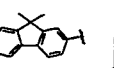
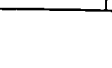
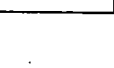
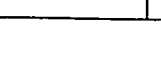
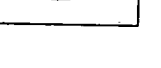
664						
665						
666						
667						
668						
669						
670						
671						
672						
673						
674						
675						
676						
677						
678						
679						

680						
681						
682						
683						
684						
685						
686						
687						
688						
689						
690						
691						
692						
693						
694						
695						

696						
697						
698						
699						
700						
701						
702						
703						
704						
705						
706						
707						
708						
709						
710						
711						

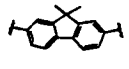
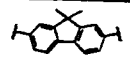
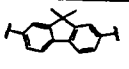
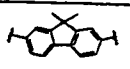
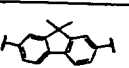
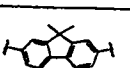
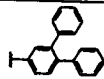
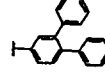
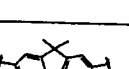
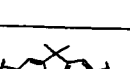
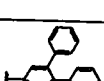
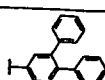
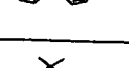
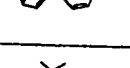
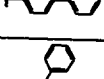
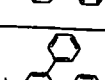
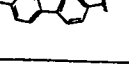
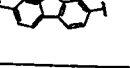
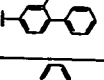
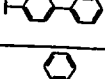
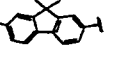
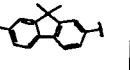
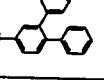
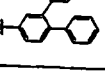
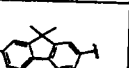
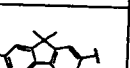
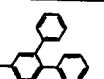
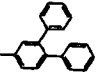
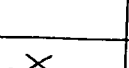
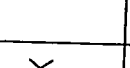
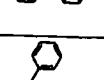
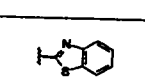
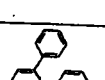
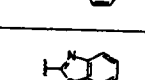
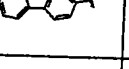
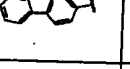
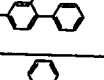
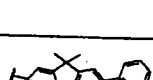
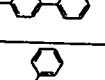
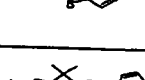
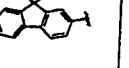
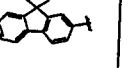
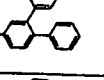
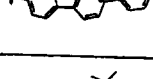
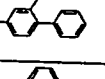
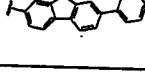
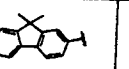
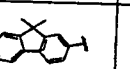
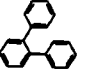
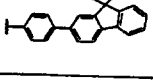
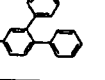
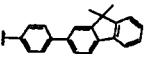
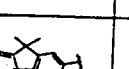
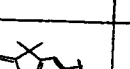
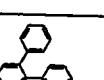
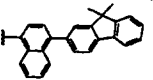
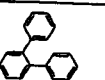
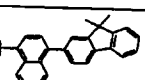
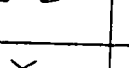
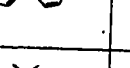
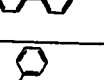
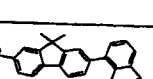
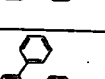
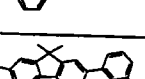
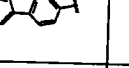
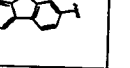
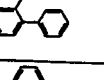
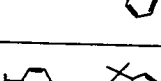
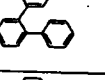
712						
713						
714						
715						
716						
717						
718						
719						
720						
721						
722						
723						
724						
725						
726						
727						

728						
729						
730						
731						
732						
733						
734						
735						
736						
737						
738						
739						
740						
741						
742						
743						
744						

745						
746						
747						
748						
749						
750						
751						
752						
753						
754						
755						
756						
757						
758						
759						
760						
761						

762						
763						
764						
765						
766						
767						
768						
769						
770						
771						
772						
773						
774						
775						
776						
777						
778						

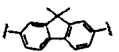
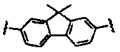
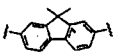
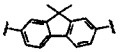
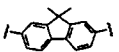
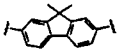
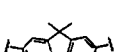
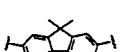
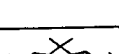
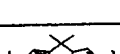
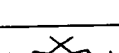
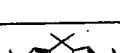
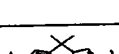
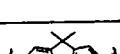
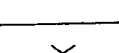
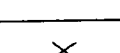
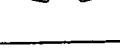
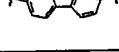
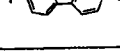
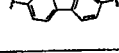
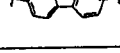
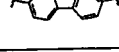
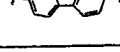
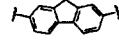
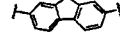
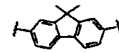
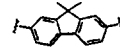
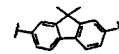
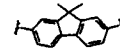
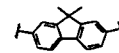
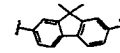
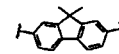
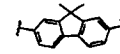


779						
780						
781						
782						
783						
784						
785						
786						
787						
788						
789						
790						
791						
792						
793						

794						
795						
796						
797						
798						
799						
800						
801						
802						
803						
804						
805						
806						
807						
808						
809						



810						
811						
812						
813						
814						
815						
816						
817						
818						
819						
820						
821						
822						
823						
824						
825						
826						

827						
828						
829						
830						
831						
832						
833						
834						
835						
836						
837						
838						
839						
840						
841						
842						
843						

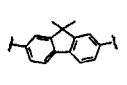
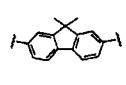
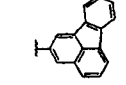
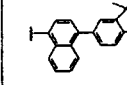
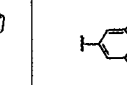
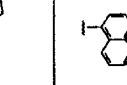
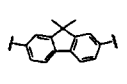
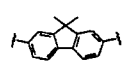
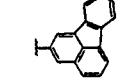
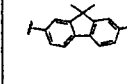
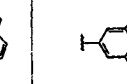
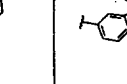
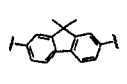
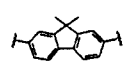
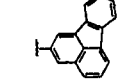
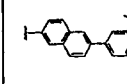
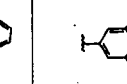
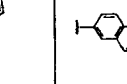
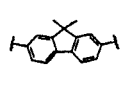
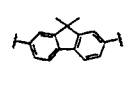
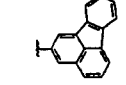
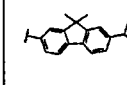
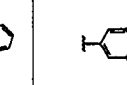
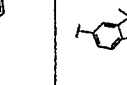
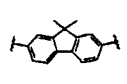
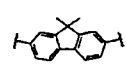
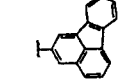
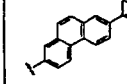
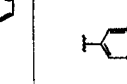
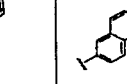
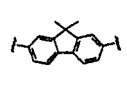
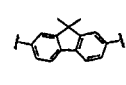
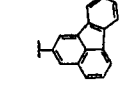
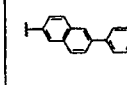
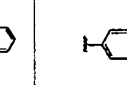
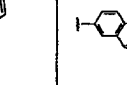
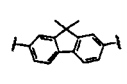
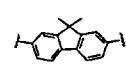
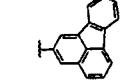
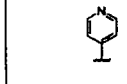
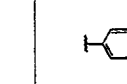
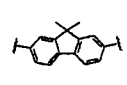
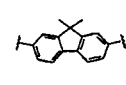
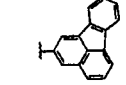
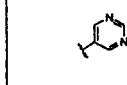
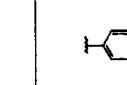
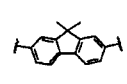
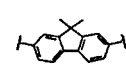
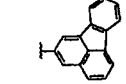
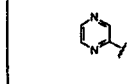
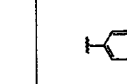
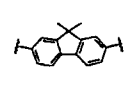
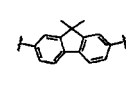
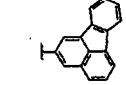
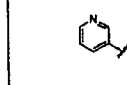
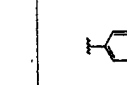
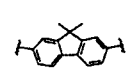
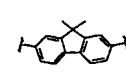
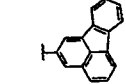
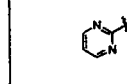
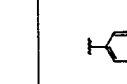
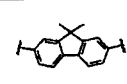
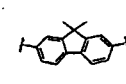
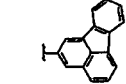
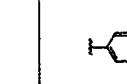
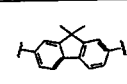
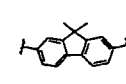
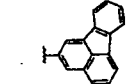
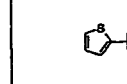
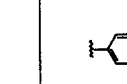


844						
845						
846						
847						
848						
849						
850						
851						
852						
853						
854						
855						
856						
857						
858						
859						
860						

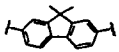
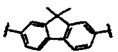
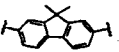
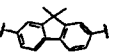
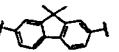
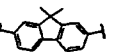
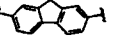
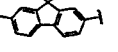
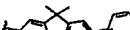
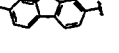
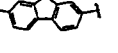
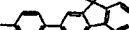
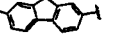
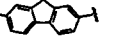
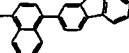
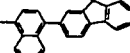
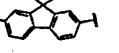
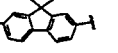
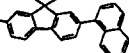
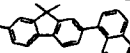
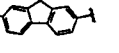
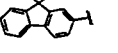
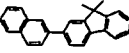
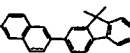
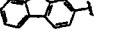
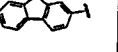
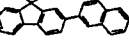
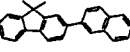
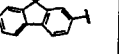
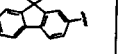
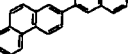
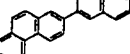
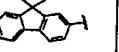
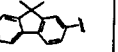
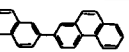
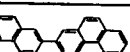
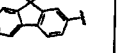
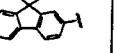
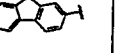
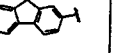
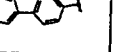
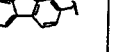
861						
862						
863						
864						
865						
866						
867						
868						
869						
870						
871						
872						
873						
874						
875						
876						
877						



878						
879						
880						
881						
882						
883						
884						
885						
886						
887						
888						
889						
890						
891						
892						
893						

894						
895						
896						
897						
898						
899						
900						
901						
902						
903						
904						
905						
906						



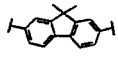
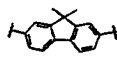
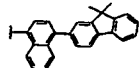
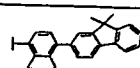
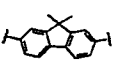
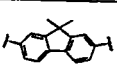
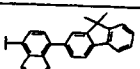
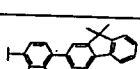
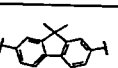
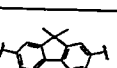
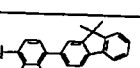
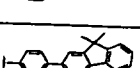
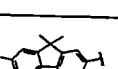
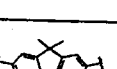
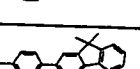
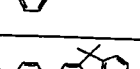
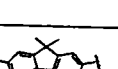
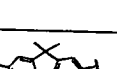
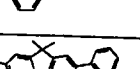
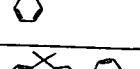
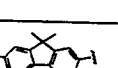
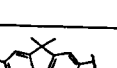
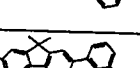
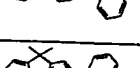
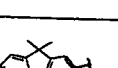
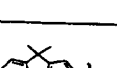
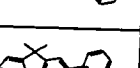
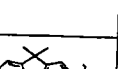
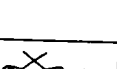
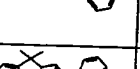
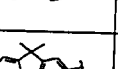
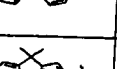
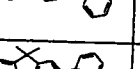
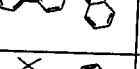
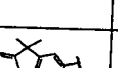
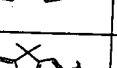
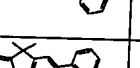
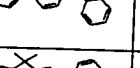
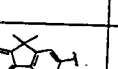
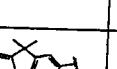
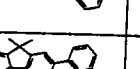
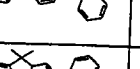
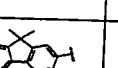
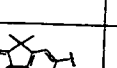
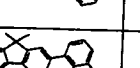
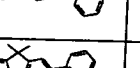
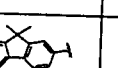
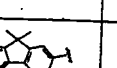
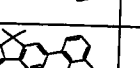
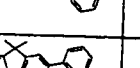
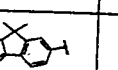
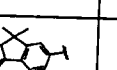
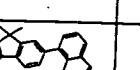
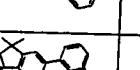
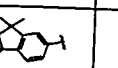
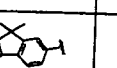
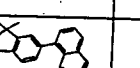
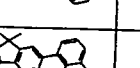
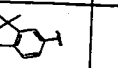
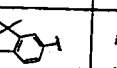
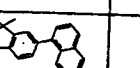
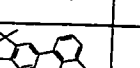
907						
908						
909						
910						
911						
912						
913						
914						
915						
916						
917						
918						
919						
920						
921						
922						

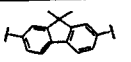
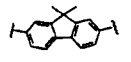
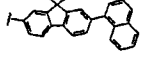
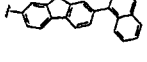
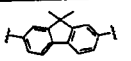
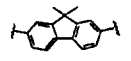
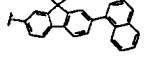
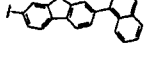
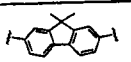
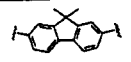
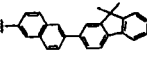
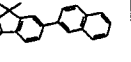
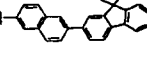
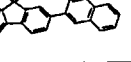
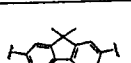
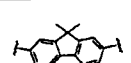
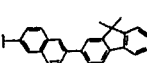
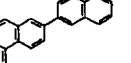
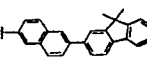
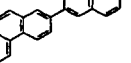
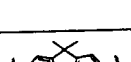
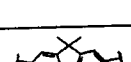
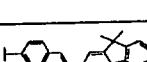
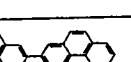
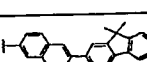
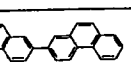
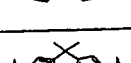
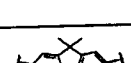
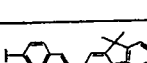
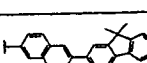
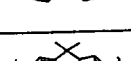
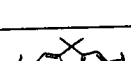
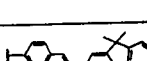
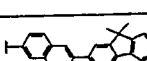
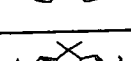
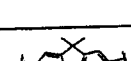
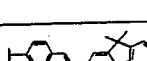
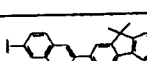
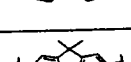
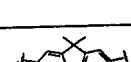
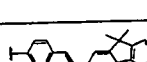
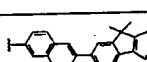
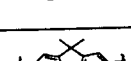
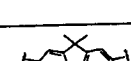
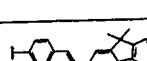
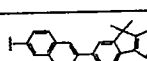
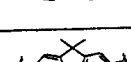
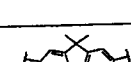
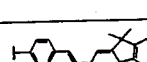
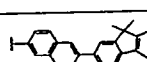
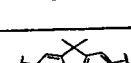
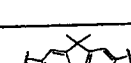
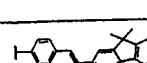
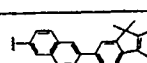
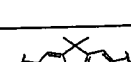
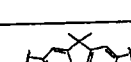
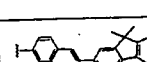
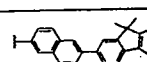
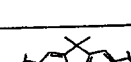
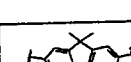
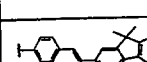
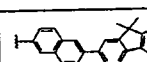
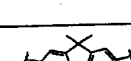
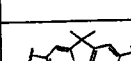
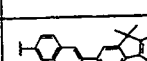
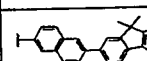
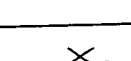
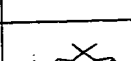
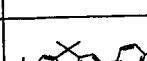
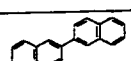
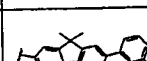
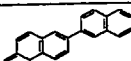
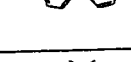
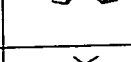
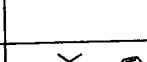
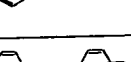
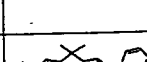
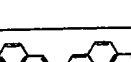
923						
924						
925						
926						
927						
928						
929						
930						
931						
932						
933						
934						
935						
936						
937						
938						
939						



940						
941						
942						
943						
944						
945						
946						
947						
948						
949						
950						
951						
952						
953						
954						
955						
956						

957						
958						
959						
960						
961						
962						
963						
964						
965						
966						
967						
968						
969						
970						
971						

972						
973						
974						
975						
976						
977						
978						
979						
980						
981						
982						
983						
984						
985						
986						
987						

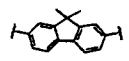
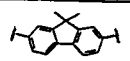
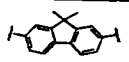
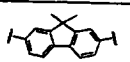
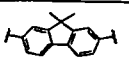
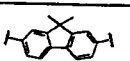
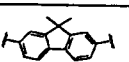
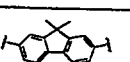
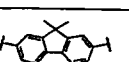
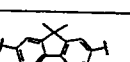
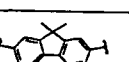
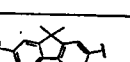
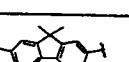
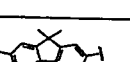
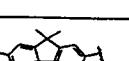
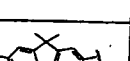
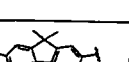
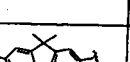
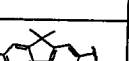
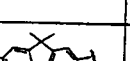
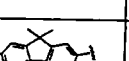
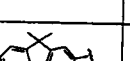
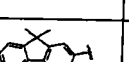
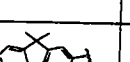
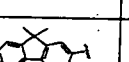
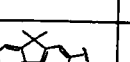
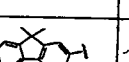
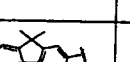
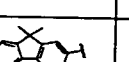
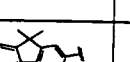
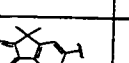
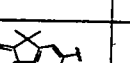
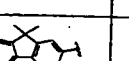
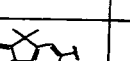
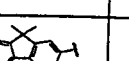
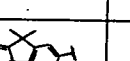
988						
989						
990						
991						
992						
993						
994						
995						
996						
997						
998						
999						
1000						
1001						
1002						
1003						
1004						

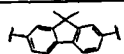
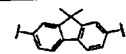
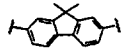
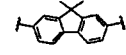
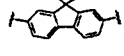
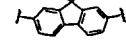
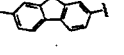
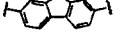
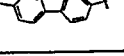
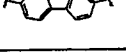
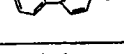
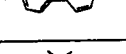
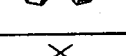
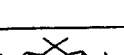
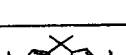
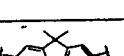
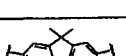
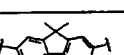
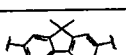
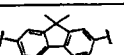
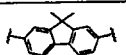
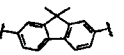
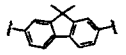
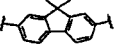
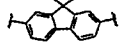
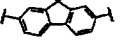
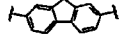
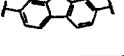
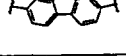
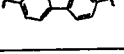
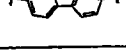
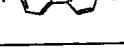
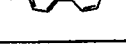


1005						
1006						
1007						
1008						
1009						
1010						
1011						
1012						
1013						
1014						
1015						
1016						
1017						
1018						
1019						
1020						

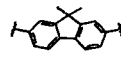
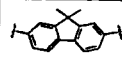
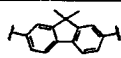
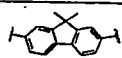
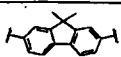
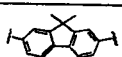
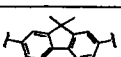
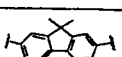
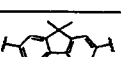
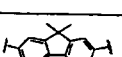
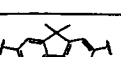
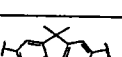
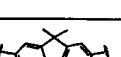
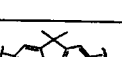
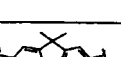
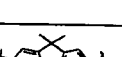
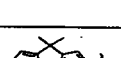
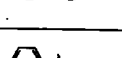
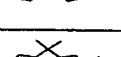
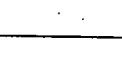
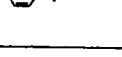
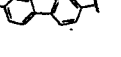
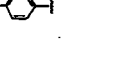
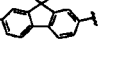
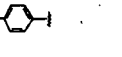
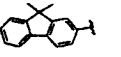
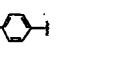
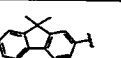
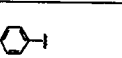
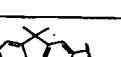
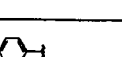
1021						
1022						
1023						
1024						
1025						
1026						
1027						
1028						
1029						
1030						
1031						
1032						
1033						
1034						
1035						
1036						



1037						
1038						
1039						
1040						
1041						
1042						
1043						
1044						
1045						
1046						
1047						
1048						
1049						
1050						
1051						
1052						
1053						
1054						

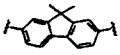
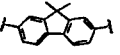
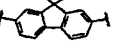
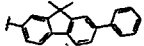
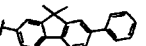
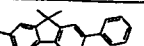
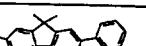
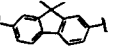
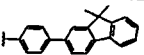
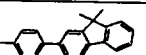
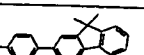
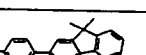
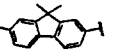
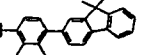
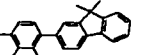
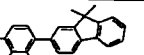
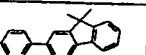
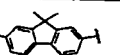
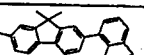
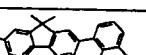
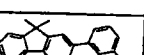
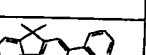
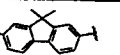
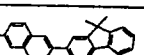
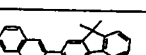
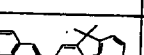
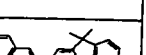
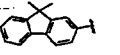
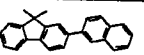
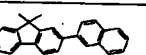
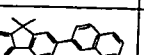
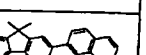
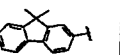
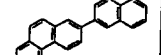
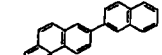
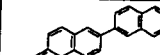
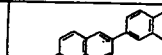
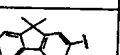
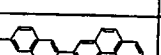
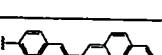
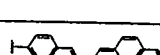
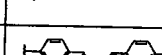
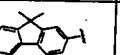
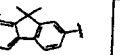
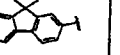
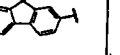
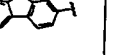
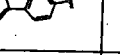
1055						
1056						
1057						
1058						
1059						
1060						
1061						
1062						
1063						
1064						
1065						
1066						
1067						
1068						
1069						
1070						
1071						
1072						



1073						
1074						
1075						
1076						
1077						
1078						
1079						
1080						
1081						
1082						
1083						
1084						
1085						
1086						
1087						
1088						
1089						

1090						
1091						
1092						
1093						
1094						
1095						
1096						
1097						
1098						
1099						
1100						
1101						
1102						
1103						
1104						
1105						
1106						



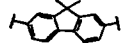
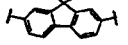
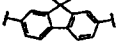
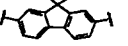
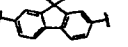
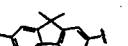
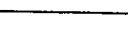
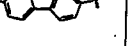
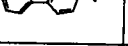
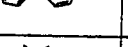
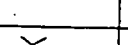
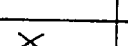
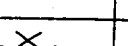
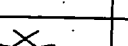
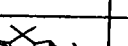
1107						
1108						
1109						
1110						
1111						
1112						
1113						
1114						
1115						
1116						
1117						
1118						
1119						
1120						
1121						
1122						
1123						

1124						
1125						
1126						
1127						
1128						
1129						
1130						
1131						
1132						
1133						
1134						
1135						
1136						
1137						
1138						
1139						

1140						
1141						
1142						
1143						
1144						
1145						
1146						
1147						
1148						
1149						
1150						
1151						
1152						
1153						
1154						
1155						
1156						

1157						
1158						
1159						
1160						
1161						
1162						
1163						
1164						
1165						
1166						
1167						
1168						
1169						
1170						
1171						
1172						
1173						

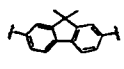
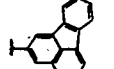
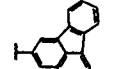
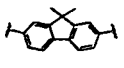
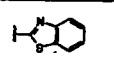
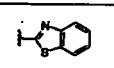
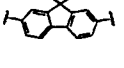
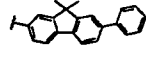
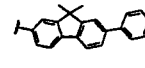
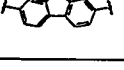
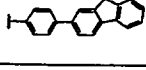
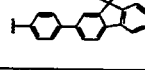
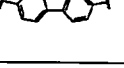
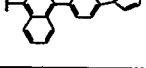
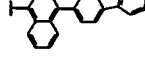
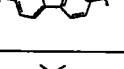
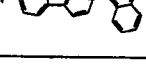
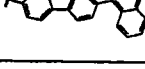
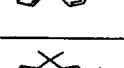
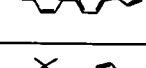
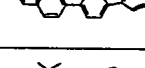
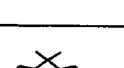
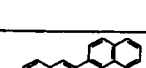
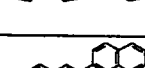
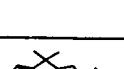
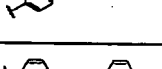
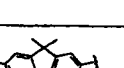
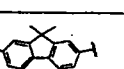
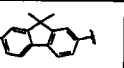
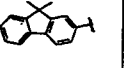
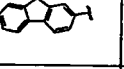
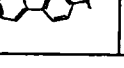


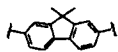
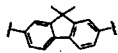
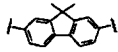
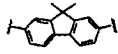
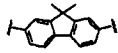
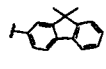
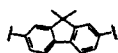
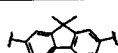
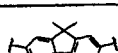
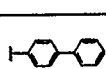
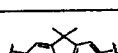
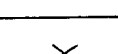
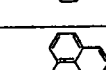
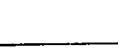
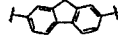
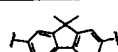
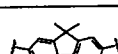
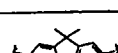
1174						
1175						
1176						
1177						
1178						
1179						
1180						
1181						
1182						
1183						
1184						
1185						
1186						
1187						
1188						
1189						

1190						
1191						
1192						
1193						
1194						
1195						
1196						
1197						
1198						
1199						
1200						
1201						
1202						
1203						
1204						
1205						
1206						

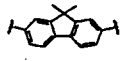
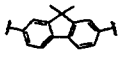
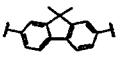
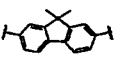
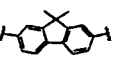
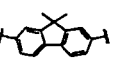
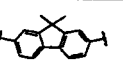
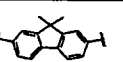
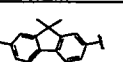
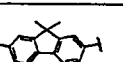
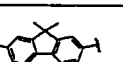
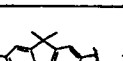
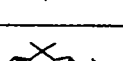
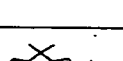
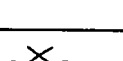
1207						
1208						
1209						
1210						
1211						
1212						
1213						
1214						
1215						
1216						
1217						
1218						
1219						
1220						
1221						
1222						

1223						
1224						
1225						
1226						
1227						
1228						
1229						
1230						
1231						
1232						
1233						
1234						
1235						
1236						
1237						
1238						

1239						
1240						
1241						
1242						
1243						
1244						
1245						
1246						
1247						
1248						
1249						
1250						
1251						
1252						
1253						
1254						

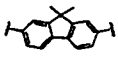
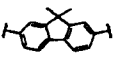
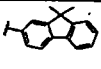
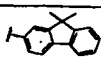
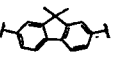
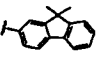
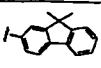
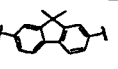
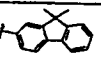
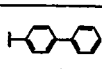
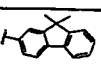
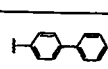
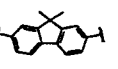
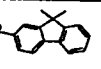
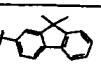
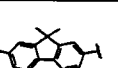
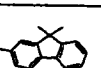
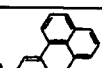
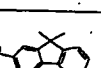
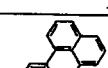
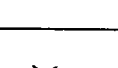
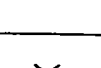
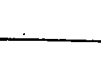
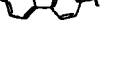
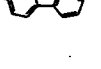
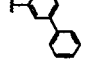
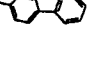
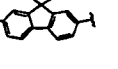
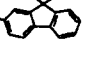
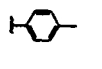
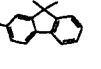
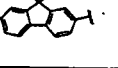
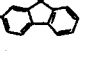
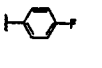
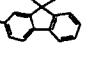
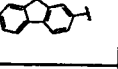
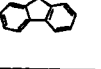
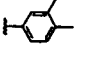
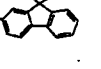
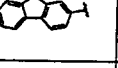
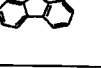
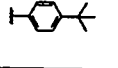
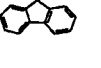
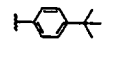
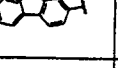
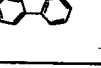
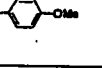
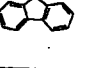
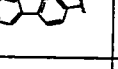
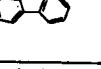
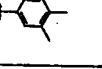
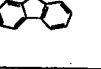
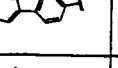
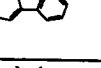
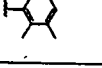
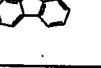
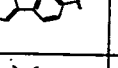
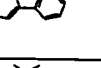
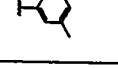
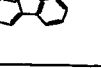
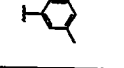
1255						
1256						
1257						
1258						
1259						
1260						
1261						
1262						
1263						
1264						
1265						
1266						
1267						
1268						
1269						

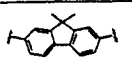
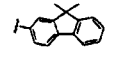
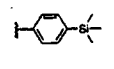
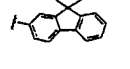
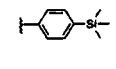
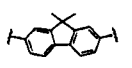
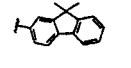
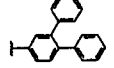
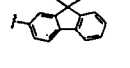
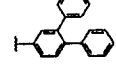
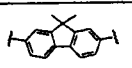
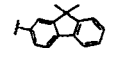
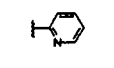
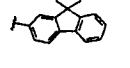
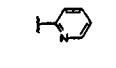
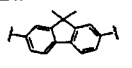
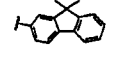
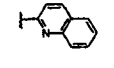
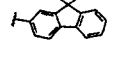
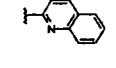
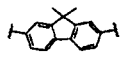
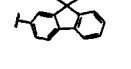
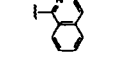
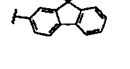
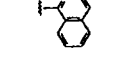
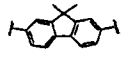
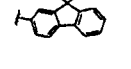
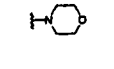
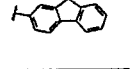
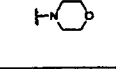
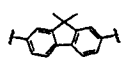
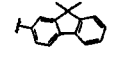
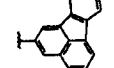
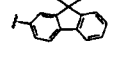
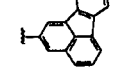
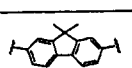
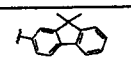
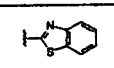
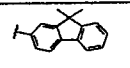
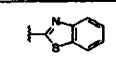
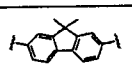
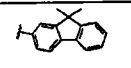
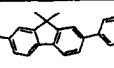
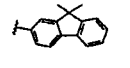
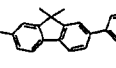
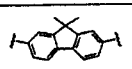
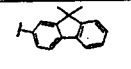
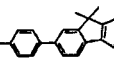
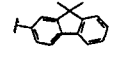
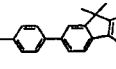
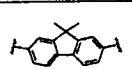
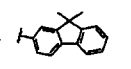
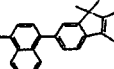
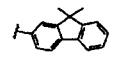
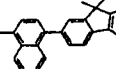
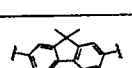
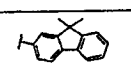
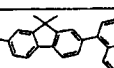
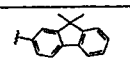
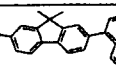
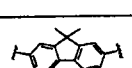
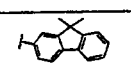
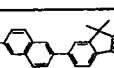
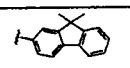
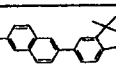
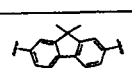
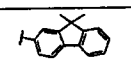
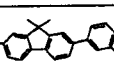
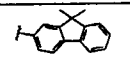
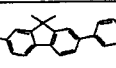
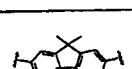
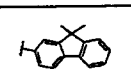
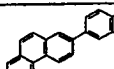
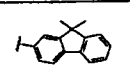
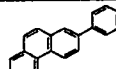
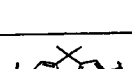
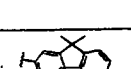
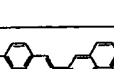
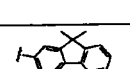
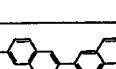


1270						
1271						
1272						
1273						
1274						
1275						
1276						
1277						
1278						
1279						
1280						
1281						
1282						
1283						
1284						

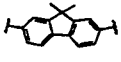
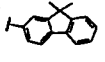
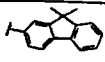
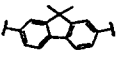
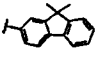
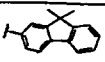
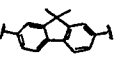
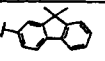
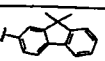
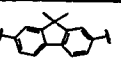
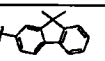
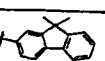
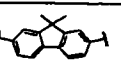
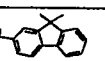
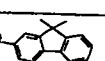
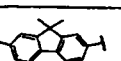
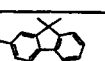
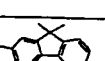
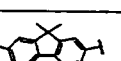
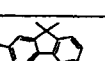
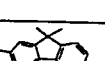
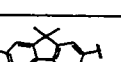
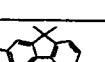
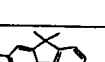
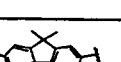
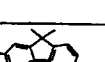
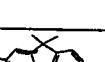
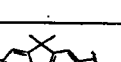
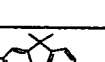
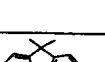
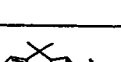
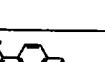
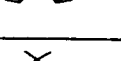
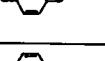
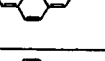
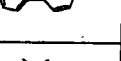
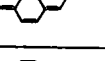
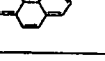
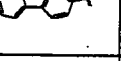
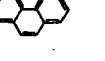
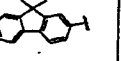
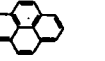
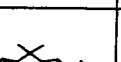
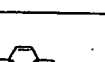
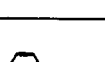
1285						
1286						
1287						
1288						
1289						
1290						
1291						
1292						
1293						
1294						
1295						
1296						
1297						
1298						
1299						

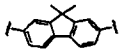
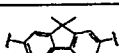
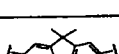
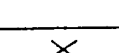
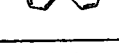
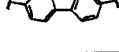
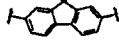
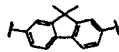
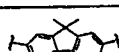
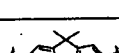
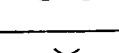
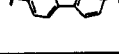
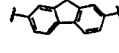
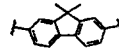
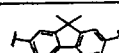
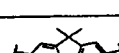
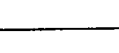


1300						
1301						
1302						
1303						
1304						
1305						
1306						
1307						
1308						
1309						
1310						
1311						
1312						
1313						
1314						
1315						

1316						
1317						
1318						
1319						
1320						
1321						
1322						
1323						
1324						
1325						
1326						
1327						
1328						
1329						
1330						
1331						



1332						
1333						
1334						
1335						
1336						
1337						
1338						
1339						
1340						
1341						
1342						
1343						
1344						
1345						
1346						
1347						

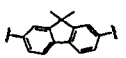
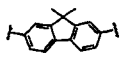
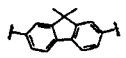
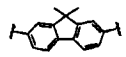
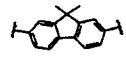
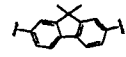
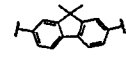
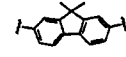
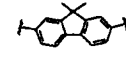
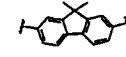
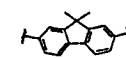
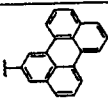
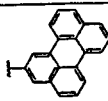
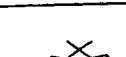
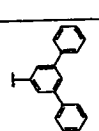
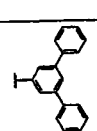
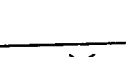
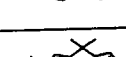
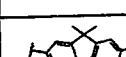
1348						
1349						
1350						
1351						
1352						
1353						
1354						
1355						
1356						
1357						
1358						
1359						
1360						
1361						
1362						
1363						
1364						



1365						
1366						
1367						
1368						
1369						
1370						
1371						
1372						
1373						
1374						
1375						
1376						
1377						
1378						
1379						
1380						
1381						

1382						
1383						
1384						
1385						
1386						
1387						
1388						
1389						
1390						
1391						
1392						
1393						
1394						
1395						
1396						

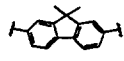
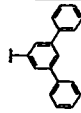
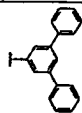
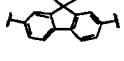
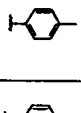
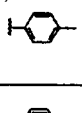
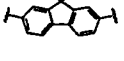
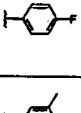
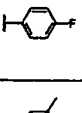
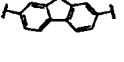
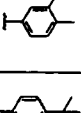
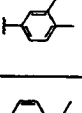
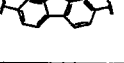
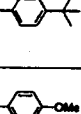
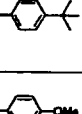
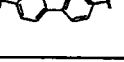
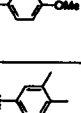
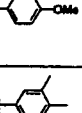
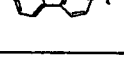
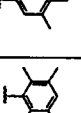
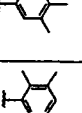
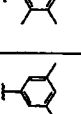
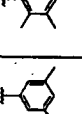
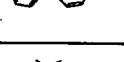
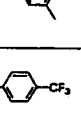
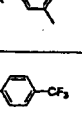
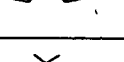
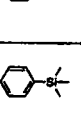
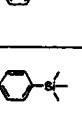
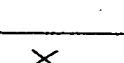
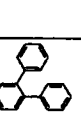
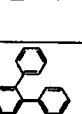
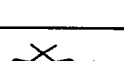
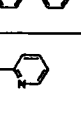
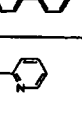
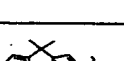
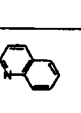
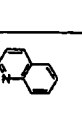
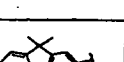
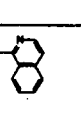
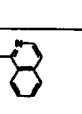
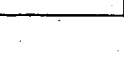
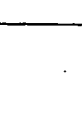
1397						
1398						
1399						
1400						
1401						
1402						
1403						
1404						
1405						
1406						
1407						
1408						
1409						
1410						
1411						

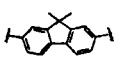
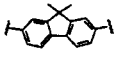
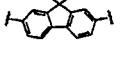
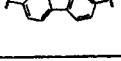
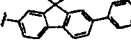
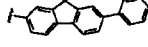
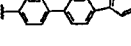
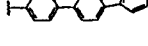
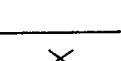
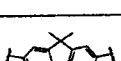
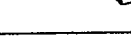
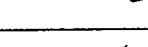
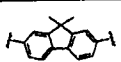
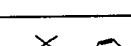
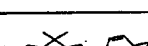
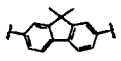
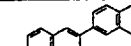
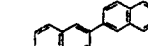
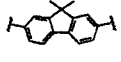
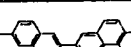
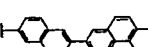
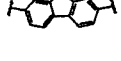
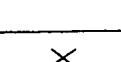
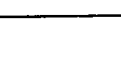
1412						
1413						
1414						
1415						
1416						
1417						
1418						
1419						
1420						
1421						
1422						
1423						
1424						
1425						
1426						



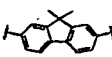
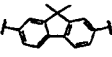
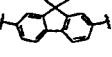
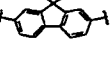
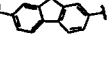
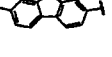
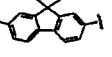
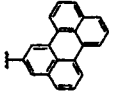
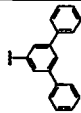
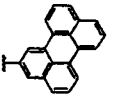
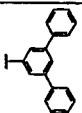
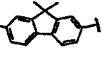
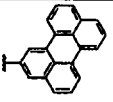
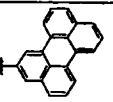
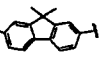
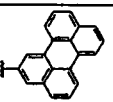
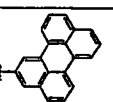
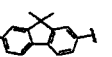
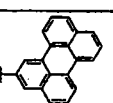
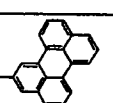
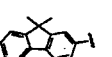
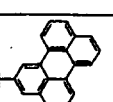
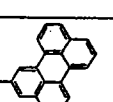
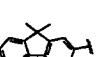
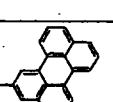
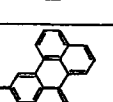
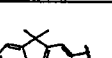
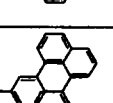
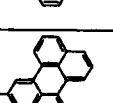
1427						
1428						
1429						
1430						
1431						
1432						
1433						
1434						
1435						
1436						
1437						
1438						
1439						
1440						
1441						
1442						
1443						

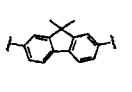
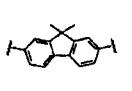
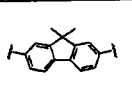
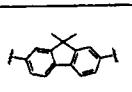
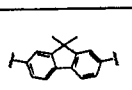
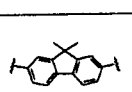
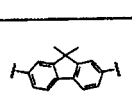
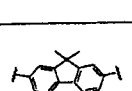
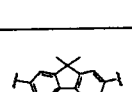
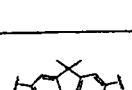
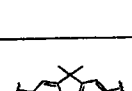
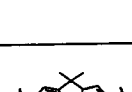
1444						
1445						
1446						
1447						
1448						
1449						
1450						
1451						
1452						
1453						
1454						
1455						
1456						
1457						
1458						
1459						

1460						
1461						
1462						
1463						
1464						
1465						
1466						
1467						
1468						
1469						
1470						
1471						
1472						
1473						
1474						

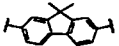
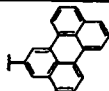
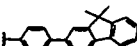
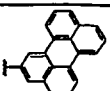
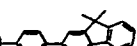
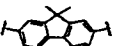
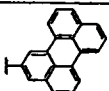
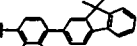
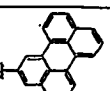
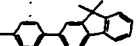
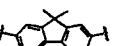
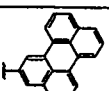
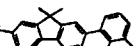
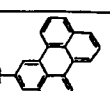
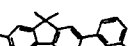
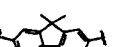
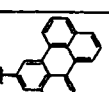
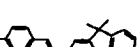
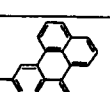
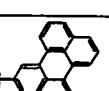
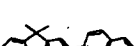
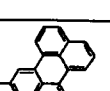
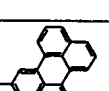
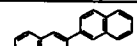
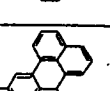
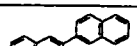
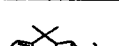
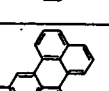
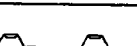
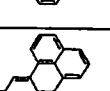
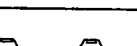
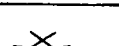
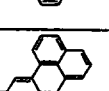
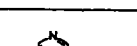
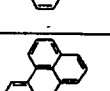
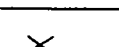
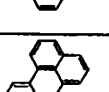
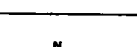
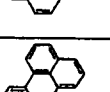
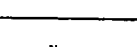
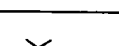
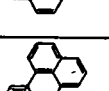
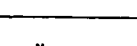
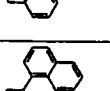
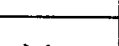
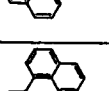
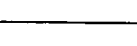
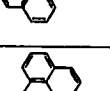
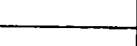
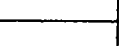
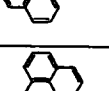
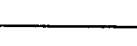
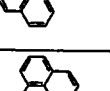
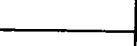
1475						
1476						
1477						
1478						
1479						
1480						
1481						
1482						
1483						
1484						
1485						
1486						
1487						
1488						
1489						

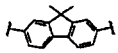
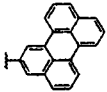
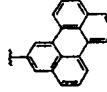
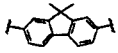
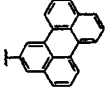
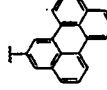
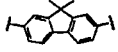
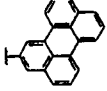
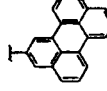
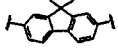
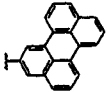
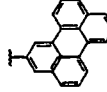
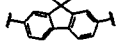
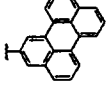
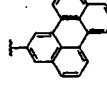
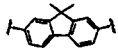
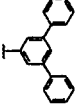
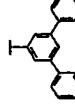
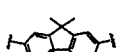
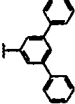
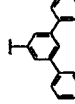
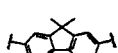
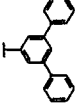
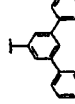
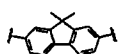
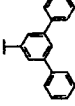
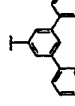
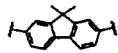
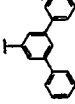
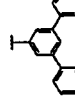
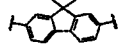
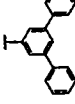
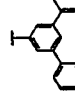


1490						
1491						
1492						
1493						
1494						
1495						
1496						
1497						
1498						
1499						
1500						
1501						
1502						

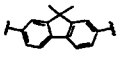
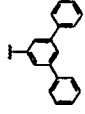
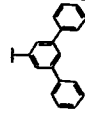
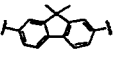
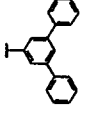
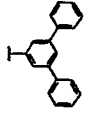
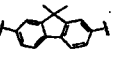
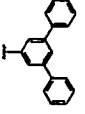
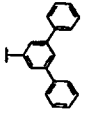
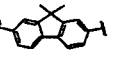
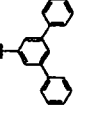
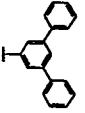
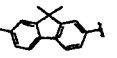
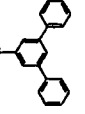
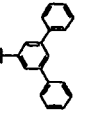
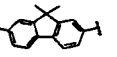
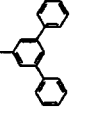
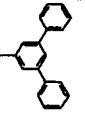
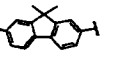
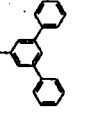
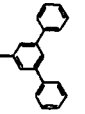
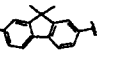
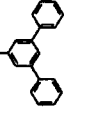
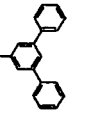
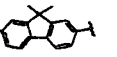
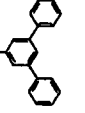
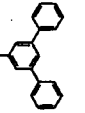
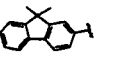
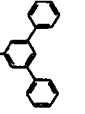
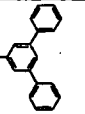
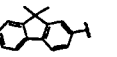
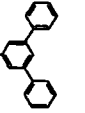
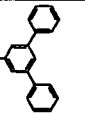
1503						
1504						
1505						
1506						
1507						
1508						
1509						
1510						
1511						
1512						
1513						
1514						



1515						
1516						
1517						
1518						
1519						
1520						
1521						
1522						
1523						
1524						
1525						
1526						

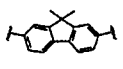
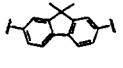
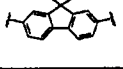
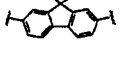
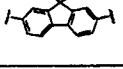
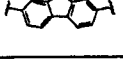
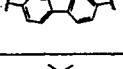
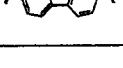
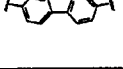
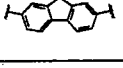
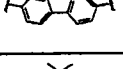
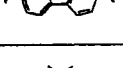
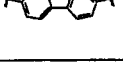
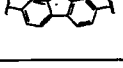
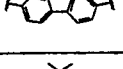
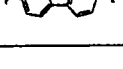
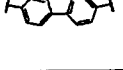
1527						
1528						
1529						
1530						
1531						
1532						
1533						
1534						
1535						
1536						
1537						



1538						
1539						
1540						
1541						
1542						
1543						
1544						
1545						
1546						
1547						
1548						

1549						
1550						
1551						
1552						
1553						
1554						
1555						
1556						
1557						
1558						
1559						

1560						
1561						
1562						
1563						
1564						
1565						
1566						
1567						
1568						
1569						
1570						
1571						
1572						

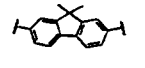
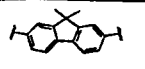
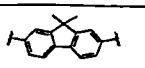
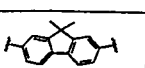
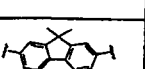
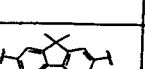
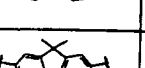
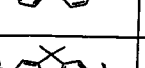
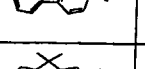
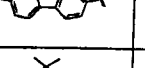
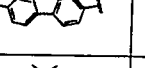
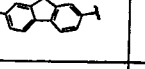
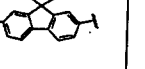
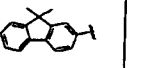
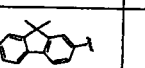
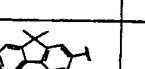
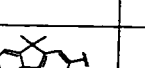
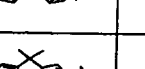
1573						
1574						
1575						
1576						
1577						
1578						
1579						
1580						
1581						
1582						
1583						
1584						
1585						
1586						
1587						
1588						
1589						

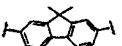
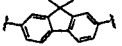
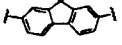
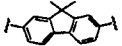
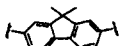
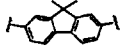
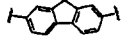
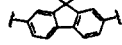
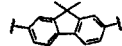
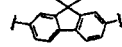
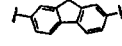
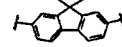
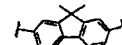
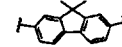
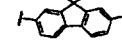
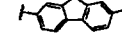
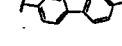


1590						
1591						
1592						
1593						
1594						
1595						
1596						
1597						
1598						
1599						
1600						
1601						
1602						
1603						
1604						
1605						
1606						
1607						

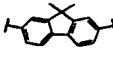
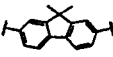
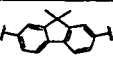
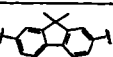
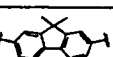
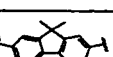
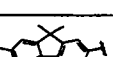
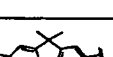
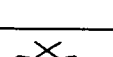
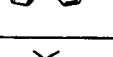
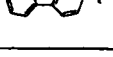
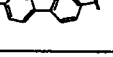
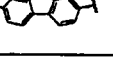
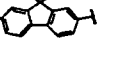
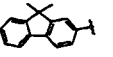
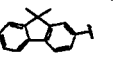
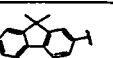
1608						
1609						
1610						
1611						
1612						
1613						
1614						
1615						
1616						
1617						
1618						
1619						
1620						
1621						
1622						
1623						
1624						

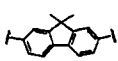
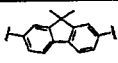
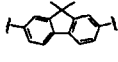
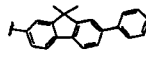
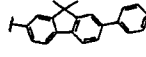
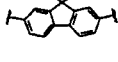
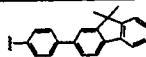
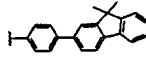
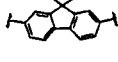
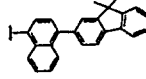
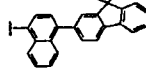
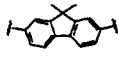
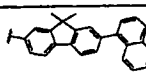
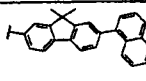
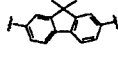
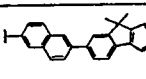
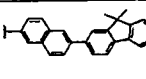
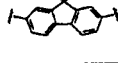
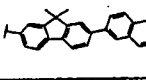
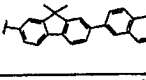
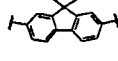
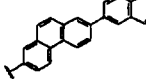
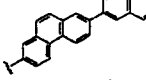
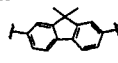
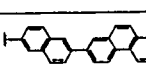
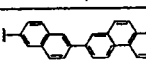
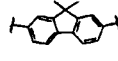
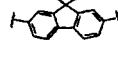
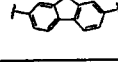
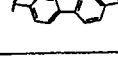
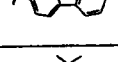
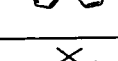
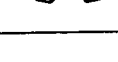


1625						
1626						
1627						
1628						
1629						
1630						
1631						
1632						
1633						
1634						
1635						
1636						
1637						
1638						
1639						
1640						
1641						
1642						

1643						
1644						
1645						
1646						
1647						
1648						
1649						
1650						
1651						
1652						
1653						
1654						
1655						
1656						
1657						
1658						
1659						



1660						
1661						
1662						
1663						
1664						
1665						
1666						
1667						
1668						
1669						
1670						
1671						
1672						
1673						
1674						
1675						
1676						

1677						
1678						
1679						
1680						
1681						
1682						
1683						
1684						
1685						
1686						
1687						
1688						
1689						
1690						
1691						
1692						
1693						



1694						
1695						
1696						
1697						
1698						
1699						
1700						
1701						
1702						
1703						
1704						
1705						
1706						
1707						
1708						
1709						
1710						

1711						
1712						
1713						
1714						
1715						
1716						
1717						
1718						
1719						
1720						
1721						
1722						
1723						
1724						
1725						
1726						
1727						

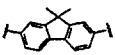
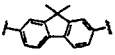
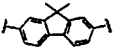
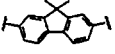
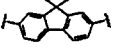
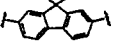
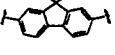
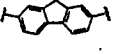
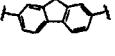
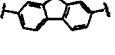
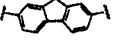
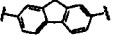
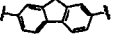
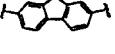
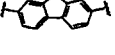
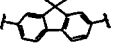


1728						
1729						
1730						
1731						
1732						
1733						
1734						
1735						
1736						
1737						
1738						
1739						
1740						
1741						
1742						
1743						

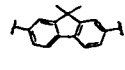
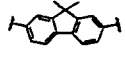
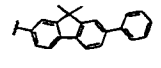
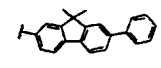
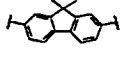
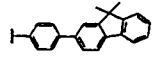
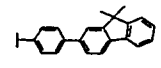
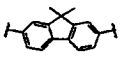
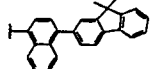
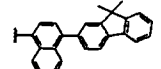
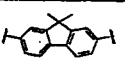
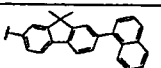
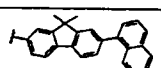
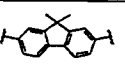
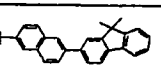
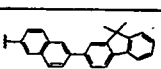
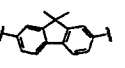
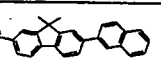
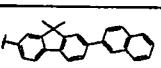
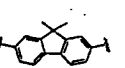
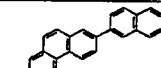
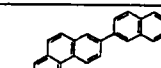
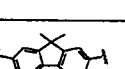
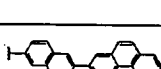
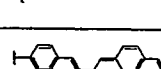
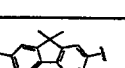
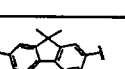
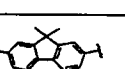
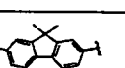
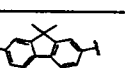
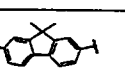
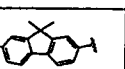
1744						
1745						
1746						
1747						
1748						
1749						
1750						
1751						
1752						
1753						
1754						
1755						
1756						
1757						
1758						
1759						



1760						
1761						
1762						
1763						
1764						
1765						
1766						
1767						
1768						
1769						
1770						
1771						
1772						
1773						
1774						
1775						

1776						
1777						
1778						
1779						
1780						
1781						
1782						
1783						
1784						
1785						
1786						
1787						
1788						
1789						
1790						
1791						



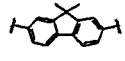
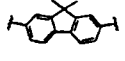
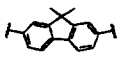
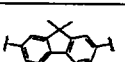
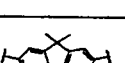
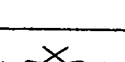
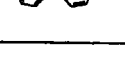
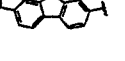
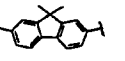
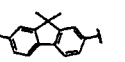
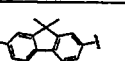
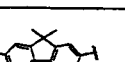
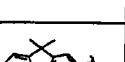
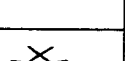
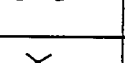
1792						
1793						
1794						
1795						
1796						
1797						
1798						
1799						
1800						
1801						
1802						
1803						
1804						
1805						
1806						
1807						

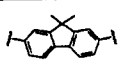
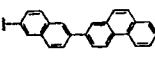
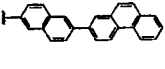
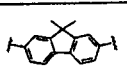
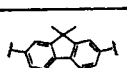
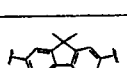
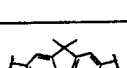
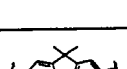
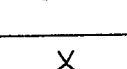
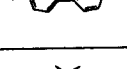
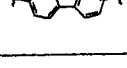
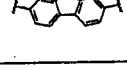
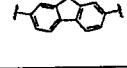
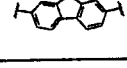
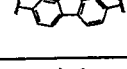
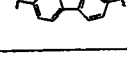
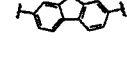
1808						
1809						
1810						
1811						
1812						
1813						
1814						
1815						
1816						
1817						
1818						
1819						
1820						
1821						
1822						
1823						
1824						



1825						
1826						
1827						
1828						
1829						
1830						
1831						
1832						
1833						
1834						
1835						
1836						
1837						
1838						
1839						
1840						
1841						

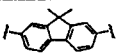
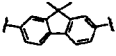
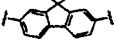
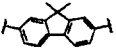
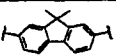
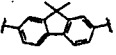
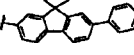
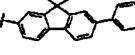
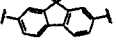
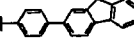
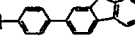
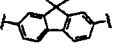
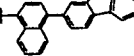
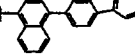
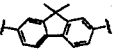
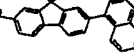
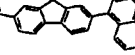
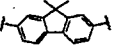
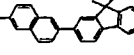
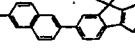
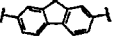
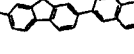
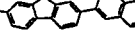
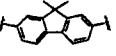
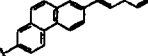
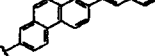
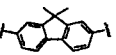
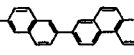
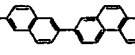
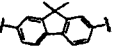
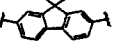
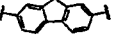
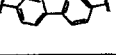
1842						
1843						
1844						
1845						
1846						
1847						
1848						
1849						
1850						
1851						
1852						
1853						
1854						
1855						
1856						
1857						
1858						

1859						
1860						
1861						
1862						
1863						
1864						
1865						
1866						
1867						
1868						
1869						
1870						
1871						
1872						
1873						

1874						
1875						
1876						
1877						
1878						
1879						
1880						
1881						
1882						
1883						
1884						
1885						
1886						
1887						
1888						
1889						



1890						
1891						
1892						
1893						
1894						
1895						
1896						
1897						
1898						
1899						
1900						
1901						
1902						
1903						
1904						
1905						
1906						

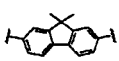
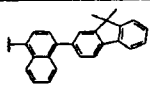
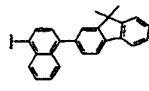
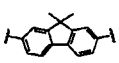
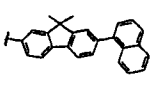
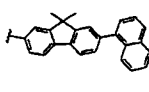
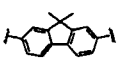
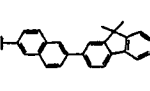
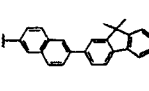
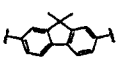
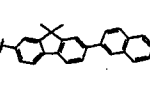
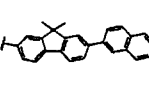
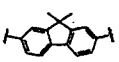
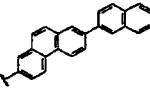
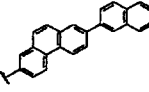
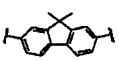
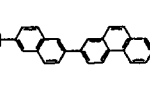
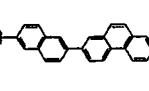
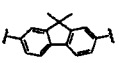
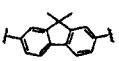
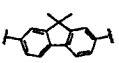
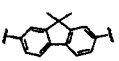
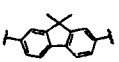
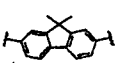
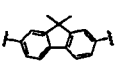
1907						
1908						
1909						
1910						
1911						
1912						
1913						
1914						
1915						
1916						
1917						
1918						
1919						
1920						
1921						
1922						
1923						



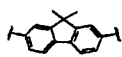
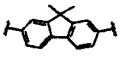
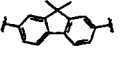
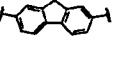
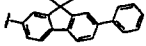
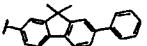
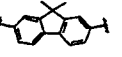
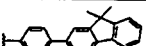
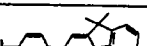
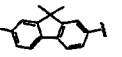
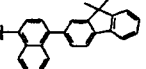
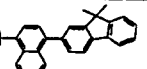
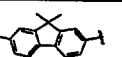
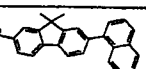
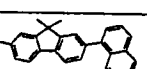
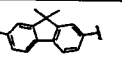
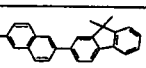
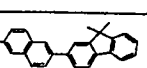
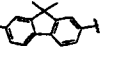
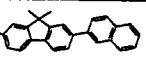
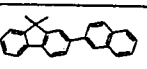
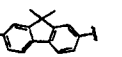
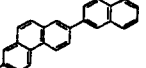
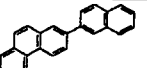
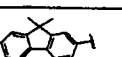
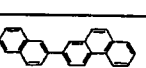
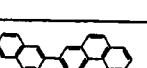
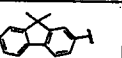
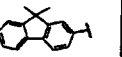
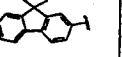
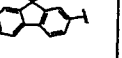
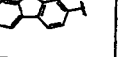
1924						
1925						
1926						
1927						
1928						
1929						
1930						
1931						
1932						
1933						
1934						
1935						
1936						
1937						
1938						
1939						
1940						

1941						
1942						
1943						
1944						
1945						
1946						
1947						
1948						
1949						
1950						
1951						
1952						
1953						
1954						
1955						
1956						
1957						

1958						
1959						
1960						
1961						
1962						
1963						
1964						
1965						
1966						
1967						
1968						
1969						
1970						
1971						
1972						
1973						

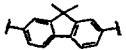
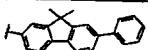
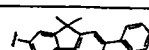
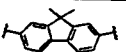
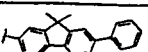
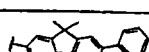
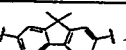
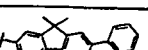
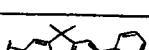
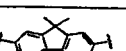
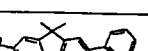
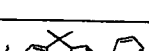
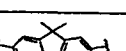
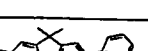
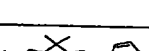
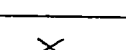
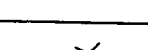
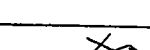
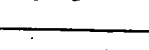
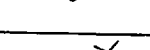
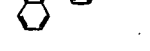
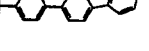
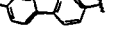
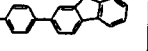
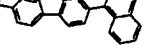
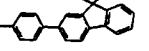
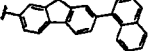
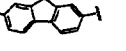
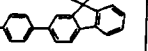
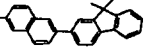
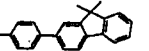
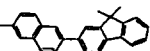
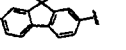
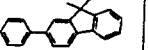
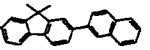
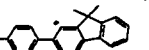
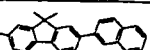
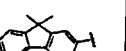
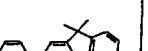
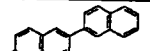
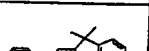
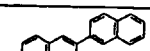
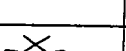
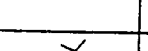
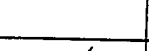
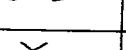
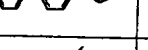
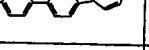
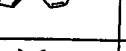
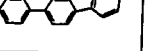
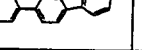
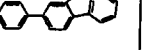
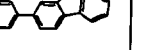
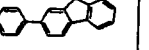
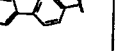
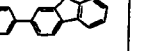
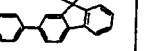
1974						
1975						
1976						
1977						
1978						
1979						
1980						
1981						
1982						
1983						
1984						
1985						
1986						



1987						
1988						
1989						
1990						
1991						
1992						
1993						
1994						
1995						
1996						
1997						
1998						
1999						
2000						
2001						
2002						

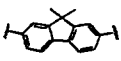
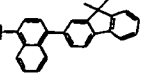
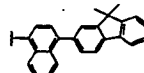
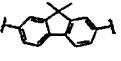
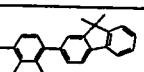
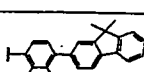
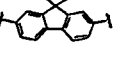
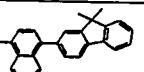
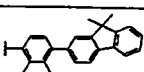
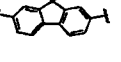
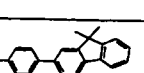
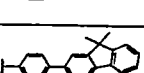
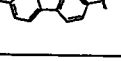
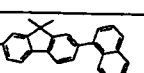
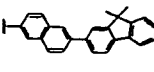
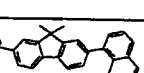
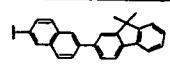
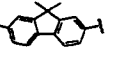
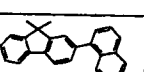
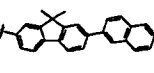
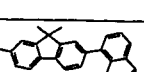
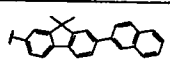
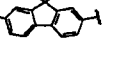
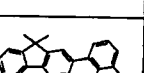
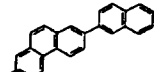
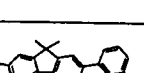
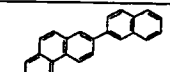
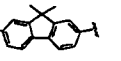
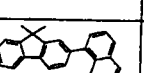
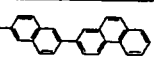
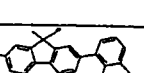
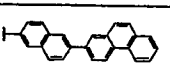
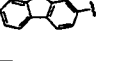
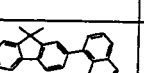
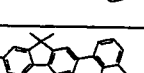
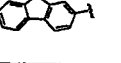
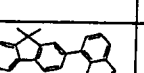
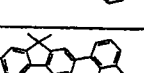
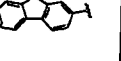
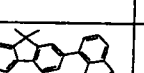
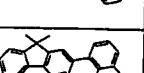
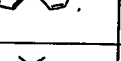
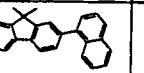
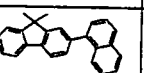
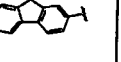
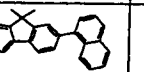
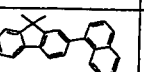
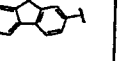
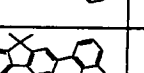
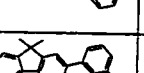
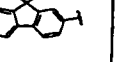
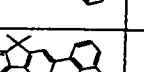
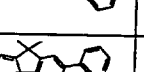
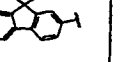
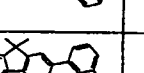
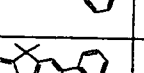
2003						
2004						
2005						
2006						
2007						
2008						
2009						
2010						
2011						
2012						
2013						
2014						
2015						
2016						
2017						
2018						
2019						



2020						
2021						
2022						
2023						
2024						
2025						
2026						
2027						
2028						
2029						
2030						
2031						
2032						
2033						
2034						
2035						
2036						

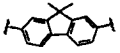
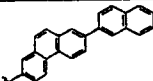
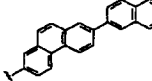
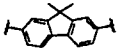
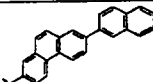
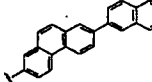
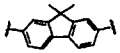
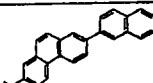
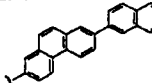
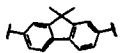
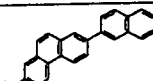
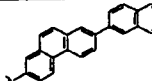
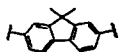
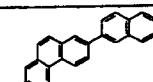
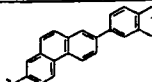
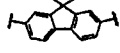
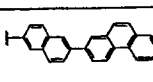
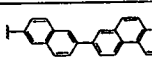
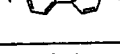
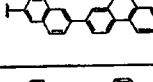
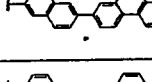
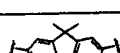
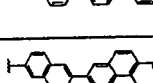
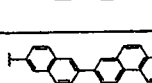
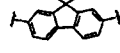
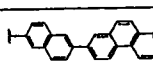
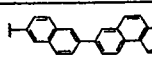
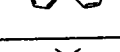
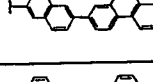
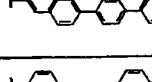
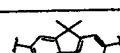
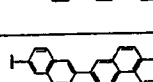
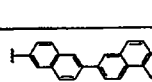
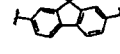
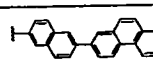
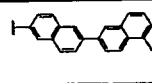
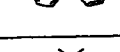
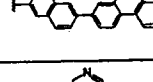
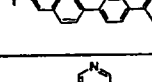
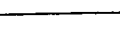
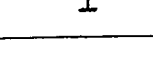
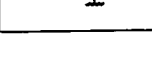
2037						
2038						
2039						
2040						
2041						
2042						
2043						
2044						
2045						
2046						
2047						
2048						
2049						
2050						
2051						



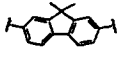
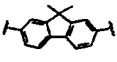
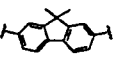
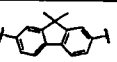
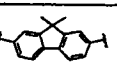
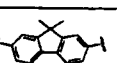
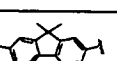
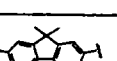
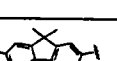
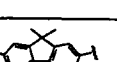
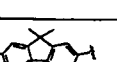
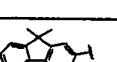
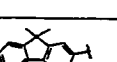
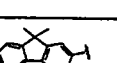
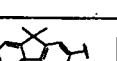
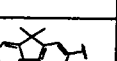
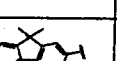
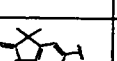
2052						
2053						
2054						
2055						
2056						
2057						
2058						
2059						
2060						
2061						
2062						
2063						
2064						
2065						
2066						
2067						

2068						
2069						
2070						
2071						
2072						
2073						
2074						
2075						
2076						
2077						
2078						
2079						
2080						
2081						
2082						
2083						
2084						

2085						
2086						
2087						
2088						
2089						
2090						
2091						
2092						
2093						
2094						
2095						
2096						
2097						
2098						
2099						
2100						

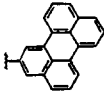
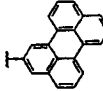
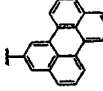
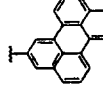
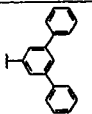
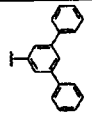
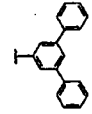
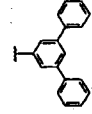
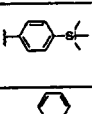
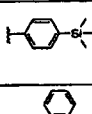
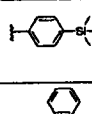
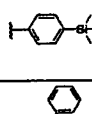
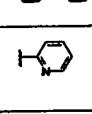
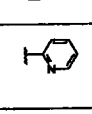
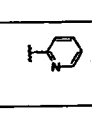
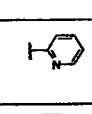
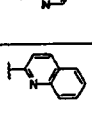
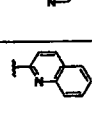
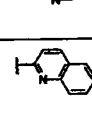
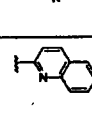
2101						
2102						
2103						
2104						
2105						
2106						
2107						
2108						
2109						
2110						
2111						
2112						
2113						
2114						
2115						
2116						



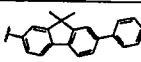
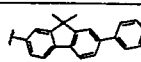
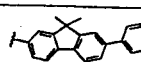
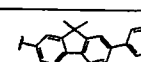
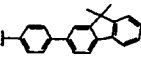
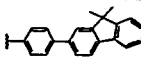
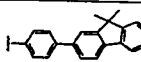
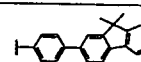
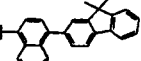
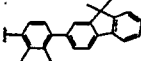
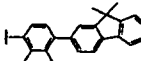
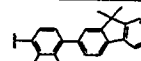
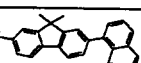
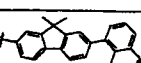
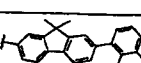
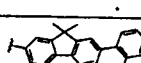
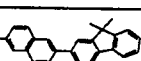
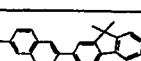
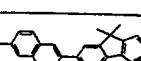
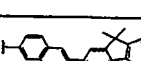
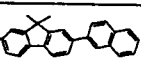
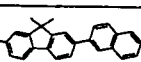
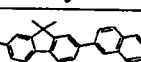
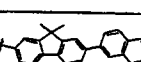
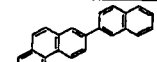
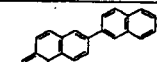
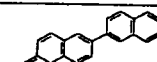
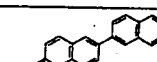
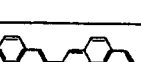
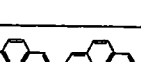
2117						
2118						
2119						
2120						
2121						
2122						
2123						
2124						
2125						
2126						
2127						
2128						
2129						
2130						
2131						
2132						
2133						
2134						

2135						
2136						
2137						
2138						
2139						
2140						
2141						
2142						
2143						
2144						
2145						
2146						
2147						
2148						
2149						
2150						
2151						
2152						

2153						
2154						
2155						
2156						
2157						
2158						
2159						
2160						
2161						
2162						
2163						
2164						
2165						
2166						
2167						
2168						
2169						

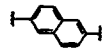
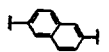
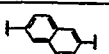
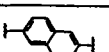
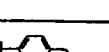
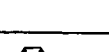
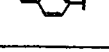
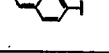
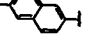
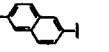
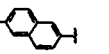
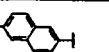
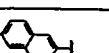
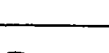
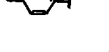
2170						
2171						
2172						
2173						
2174						
2175						
2176						
2177						
2178						
2179						
2180						
2181						
2182						
2183						
2184						
2185						

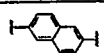
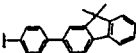
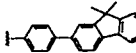
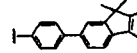
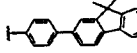
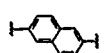
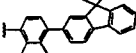
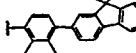
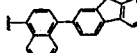
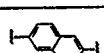
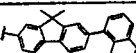
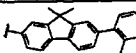
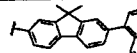
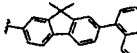
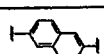
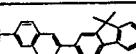
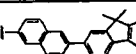
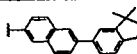
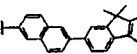
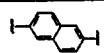
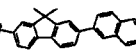
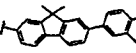
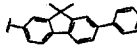
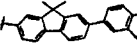
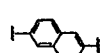
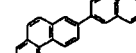
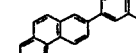
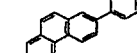
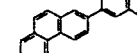
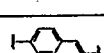
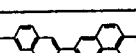
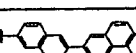
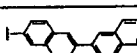
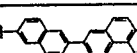
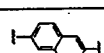
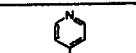
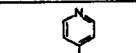
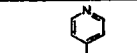
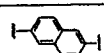
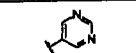
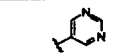
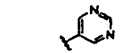
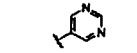
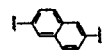
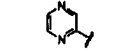
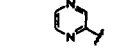
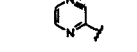
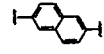
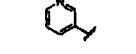
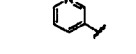
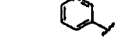
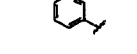
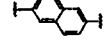
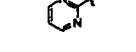
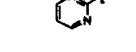
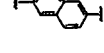
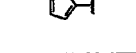
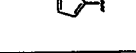
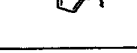
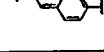
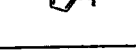
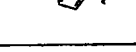
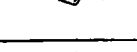
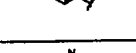
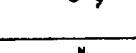
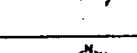
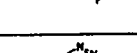
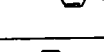
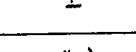
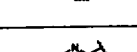
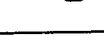
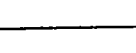
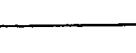
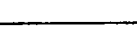


2186						
2187						
2188						
2189						
2190						
2191						
2192						
2193						
2194						
2195						
2196						
2197						
2198						
2199						
2200						
2201						
2202						

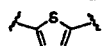
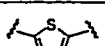
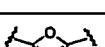
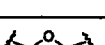
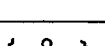
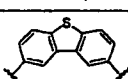
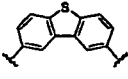
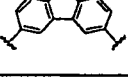
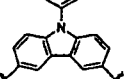
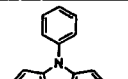
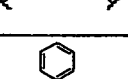
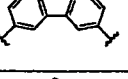
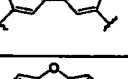
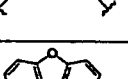
2203						
2204						
2205						
2206						
2207						
2208						
2209						
2210						
2211						
2212						
2213						
2214						
2215						
2216						
2217						
2218						

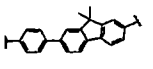
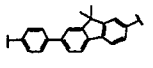
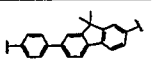
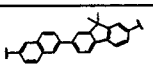
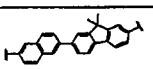
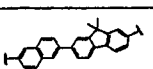
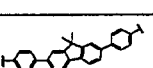
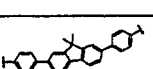
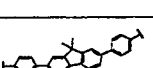
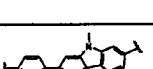
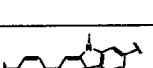
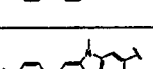
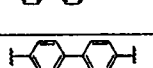
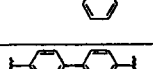
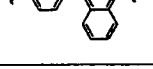
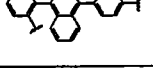


2219						
2220						
2221						
2222						
2223						
2224						
2225						
2226						
2227						
2228						
2229						
2230						
2231						
2232						
2233						
2234						
2235						

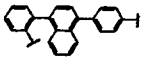
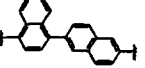
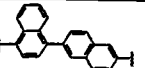
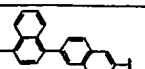
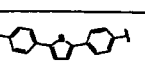
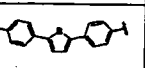
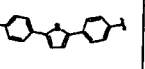
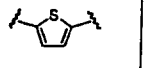
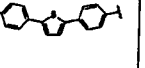
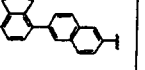
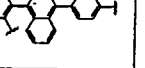
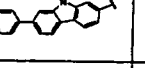
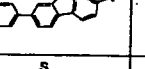
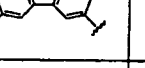
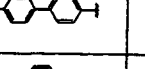
2236						
2237						
2238						
2239						
2240						
2241						
2242						
2243						
2244						
2245						
2246						
2247						
2248						
2249						
2250						
2251						
2252						

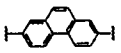
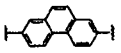
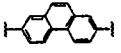
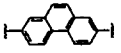
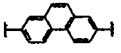
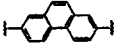
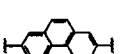
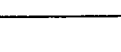
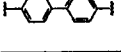
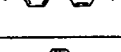
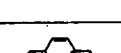
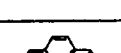
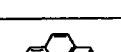


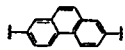
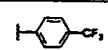
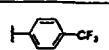
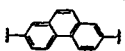
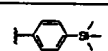
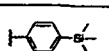
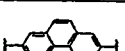
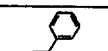
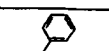
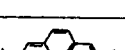
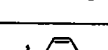
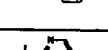
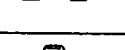
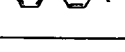
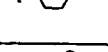
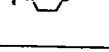
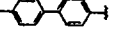
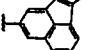
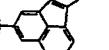
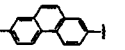
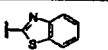
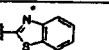
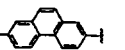
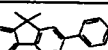
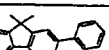
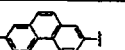
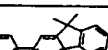
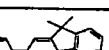
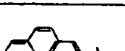
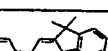
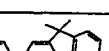
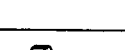
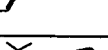
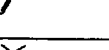
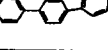
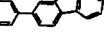
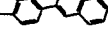
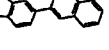
2253						
2254						
2255						
2256						
2257						
2258						
2259						
2260						
2261						
2262						
2263						
2264						
2265						
2266						
2267						

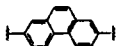
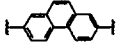
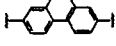
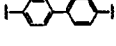
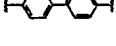
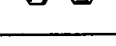
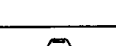
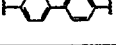
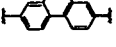
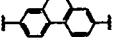
2268						
2269						
2270						
2271						
2272						
2273						
2274						
2275						
2276						
2277						
2278						
2279						
2280						
2281						
2282						
2283						
2284						



2285						
2286						
2287						
2288						
2289						
2290						
2291						
2292						
2293						
2294						
2295						
2296						
2297						
2298						
2299						
2300						
2301						

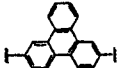
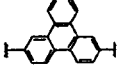
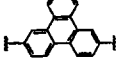
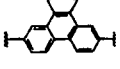
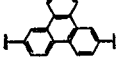
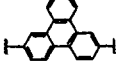
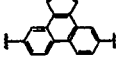
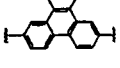
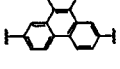
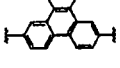
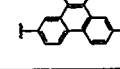
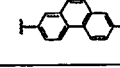
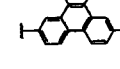
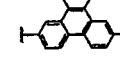
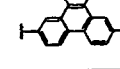
2302						
2303						
2304						
2305						
2306						
2307						
2308						
2309						
2310						
2311						
2312						
2313						
2314						
2315						
2316						
2317						

2318						
2319						
2320						
2321						
2322						
2323						
2324						
2325						
2326						
2327						
2328						
2329						
2330						
2331						
2332						
2333						
2334						

2335						
2336						
2337						
2338						
2339						
2340						
2341						
2342						
2343						
2344						
2345						
2346						
2347						
2348						
2349						
2350						
2351						

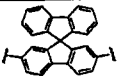
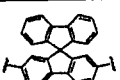
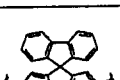
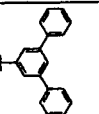
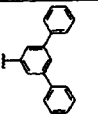
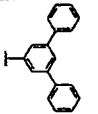
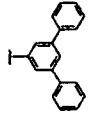
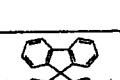
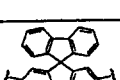
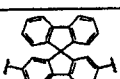
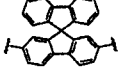
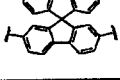
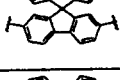
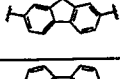
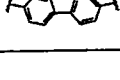


2352						
2353						
2354						
2355						
2356						
2357						
2358						
2359						
2360						
2361						
2362						
2363						
2364						
2365						
2366						

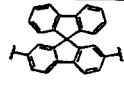
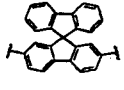
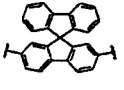
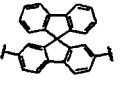
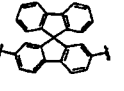
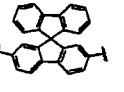
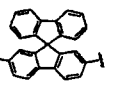
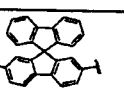
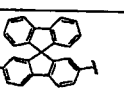
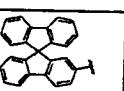
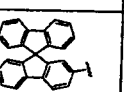
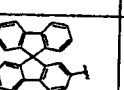
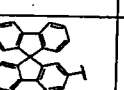
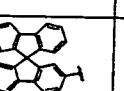
2367						
2368						
2369						
2370						
2371						
2372						
2373						
2374						
2375						
2376						
2377						
2378						
2379						
2380						
2381						



2382						
2383						
2384						
2385						
2386						
2387						
2388						
2389						
2390						
2391						
2392						
2393						
2394						
2395						
2396						

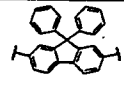
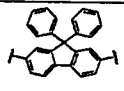
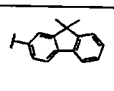
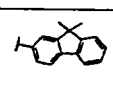
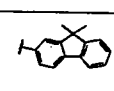
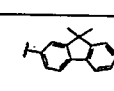
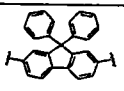
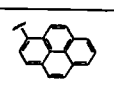
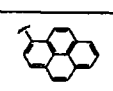
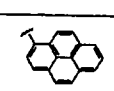
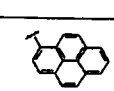
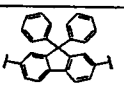
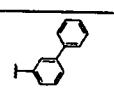
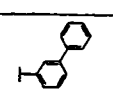
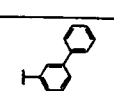
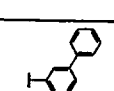
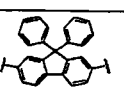
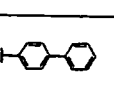
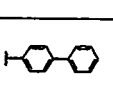
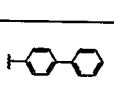
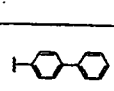
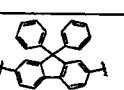
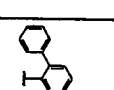
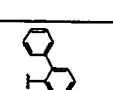
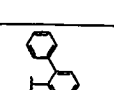
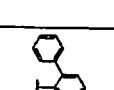
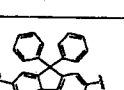
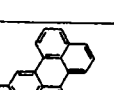
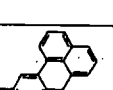
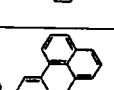
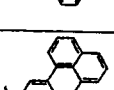
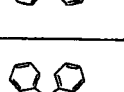
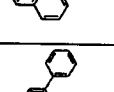
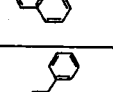
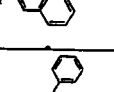
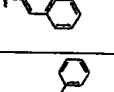
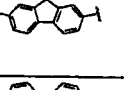
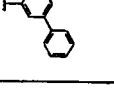
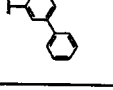
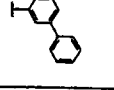
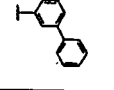
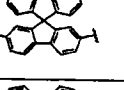
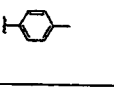
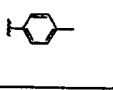
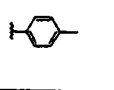
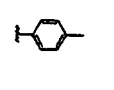
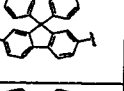
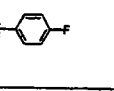
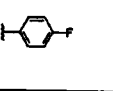
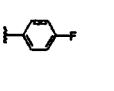
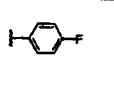
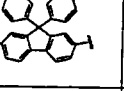
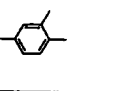
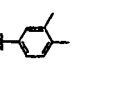
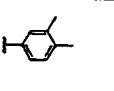
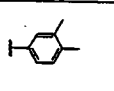
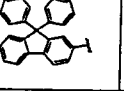
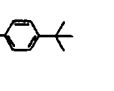
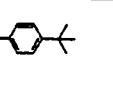
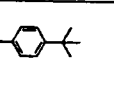
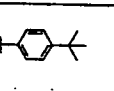
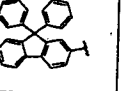
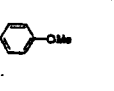
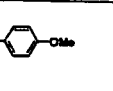
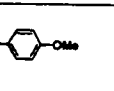
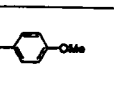
2397						
2398						
2399						
2400						
2401						
2402						
2403						
2404						
2405						
2406						
2407						
2408						
2409						
2410						



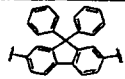
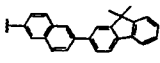
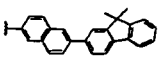
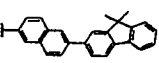
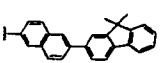
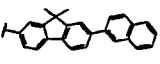
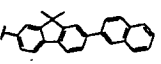
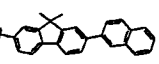
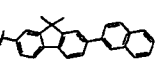
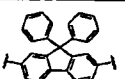
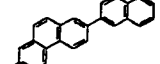
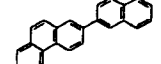
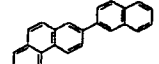
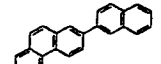
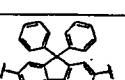
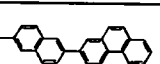
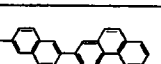
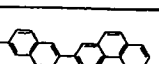
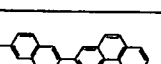
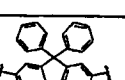
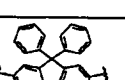
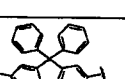
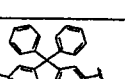
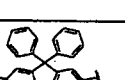
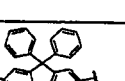
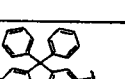
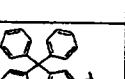
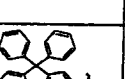
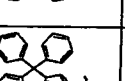
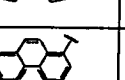
2411						
2412						
2413						
2414						
2415						
2416						
2417						
2418						
2419						
2420						
2421						
2422						
2423						
2424						

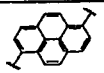
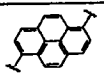
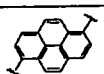
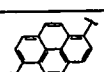
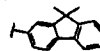
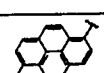
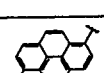
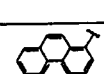
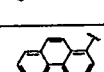
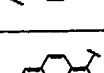
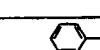
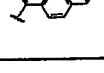
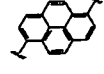
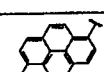
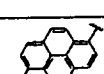
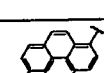
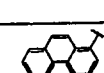
2425						
2426						
2427						
2428						
2429						
2430						
2431						
2432						
2433						
2434						
2435						
2436						
2437						
2438						
2439						



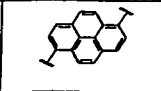
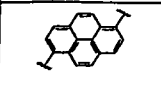
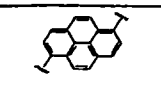
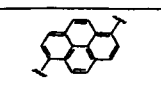
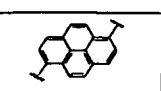
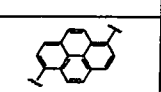
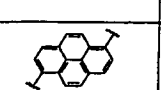
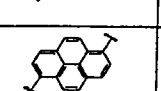
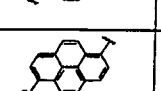
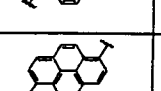
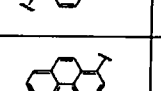
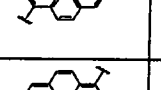
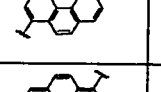
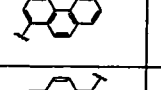
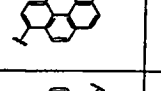
2440						
2441						
2442						
2443						
2444						
2445						
2446						
2447						
2448						
2449						
2450						
2451						
2452						
2453						

2454						
2455						
2456						
2457						
2458						
2459						
2460						
2461						
2462						
2463						
2464						
2465						
2466						
2467						
2468						

2469						
2470						
2471						
2472						
2473						
2474						
2475						
2476						
2477						
2478						
2479						
2480						
2481						
2482						
2483						

2484						
2485						
2486						
2487						
2488						
2489						
2490						
2491						
2492						
2493						
2494						
2495						
2496						
2497						
2498						

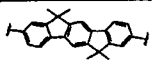
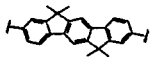
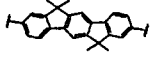
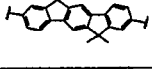
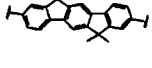
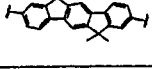
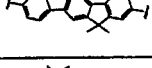
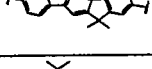
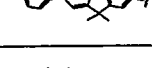
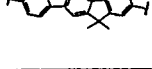
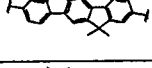
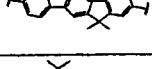
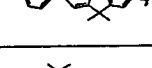
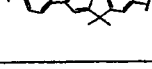
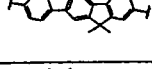
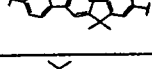
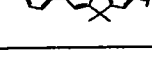


2499						
2500						
2501						
2502						
2503						
2504						
2505						
2506						
2507						
2508						
2509						
2510						
2511						
2512						
2513						

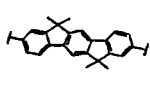
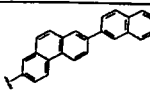
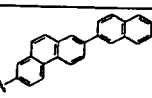
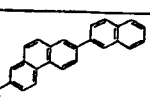
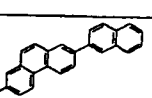
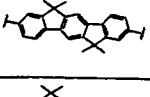
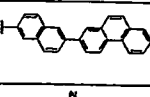
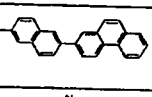
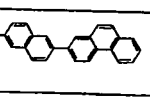
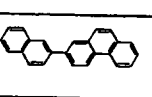
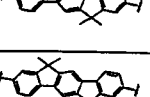
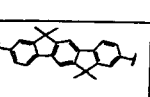
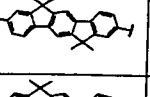
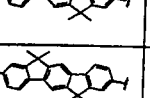
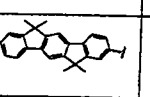
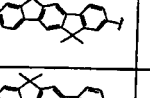
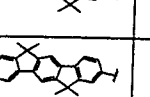
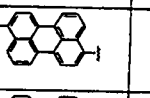
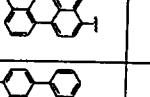
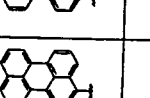
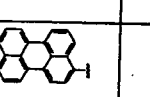
2514						
2515						
2516						
2517						
2518						
2519						
2520						
2521						
2522						
2523						
2524						
2525						
2526						
2527						
2528						
2529						

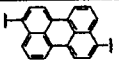
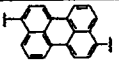
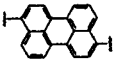
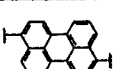
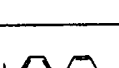
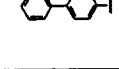
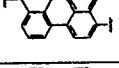
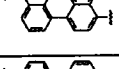
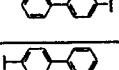
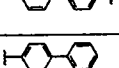
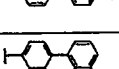
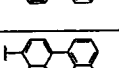
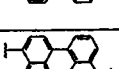
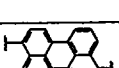


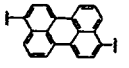
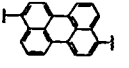
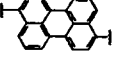
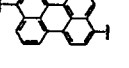
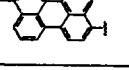
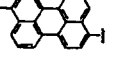
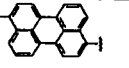
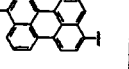
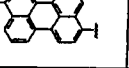
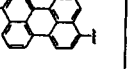
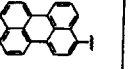
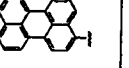
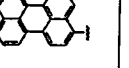
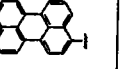
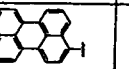
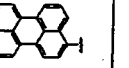
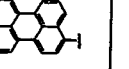
2530						
2531						
2532						
2533						
2534						
2535						
2536						
2537						
2538						
2539						
2540						
2541						
2542						
2543						
2544						
2545						

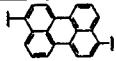
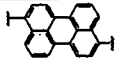
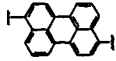
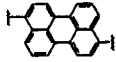
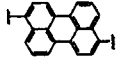
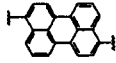
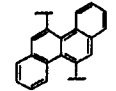
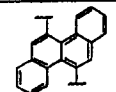
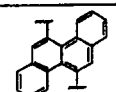
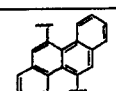
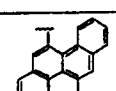
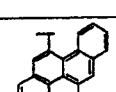
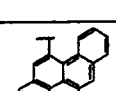
2546						
2547						
2548						
2549						
2550						
2551						
2552						
2553						
2554						
2555						
2556						
2557						
2558						
2559						
2560						
2561						
2562						

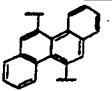
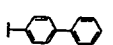
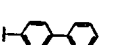
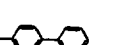
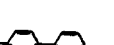
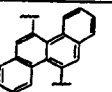
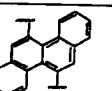
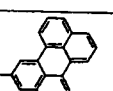
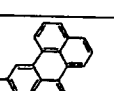
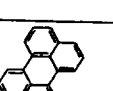
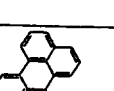
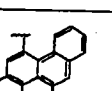
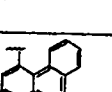
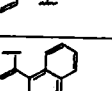
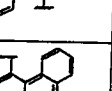
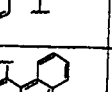
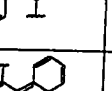
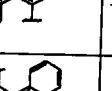
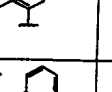
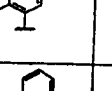


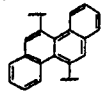
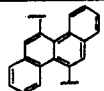
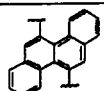
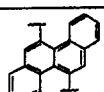
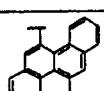
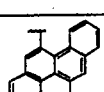
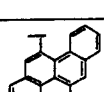
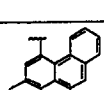
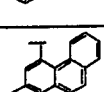
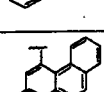
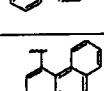
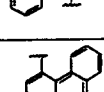
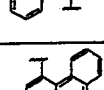
2563						
2564						
2565						
2566						
2567						
2568						
2569						
2570						
2571						
2572						
2573						
2574						
2575						
2576						
2577						
2578						
2579						

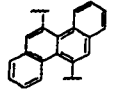
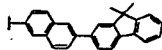
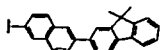
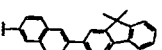
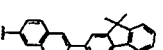
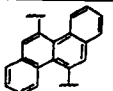
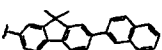
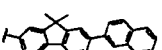
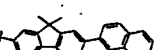
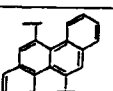
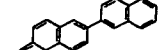
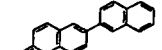
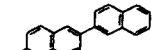
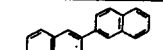
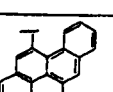
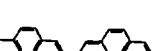
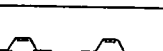
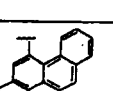
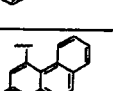
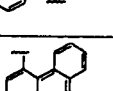
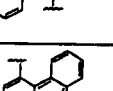
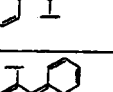
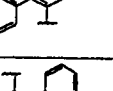
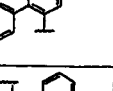
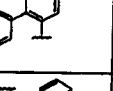
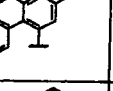
2580						
2581						
2582						
2583						
2584						
2585						
2586						
2587						
2588						
2589						
2590						
2591						
2592						
2593						
2594						
2595						

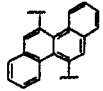
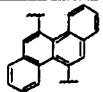
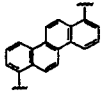
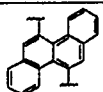
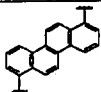
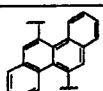
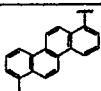
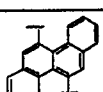
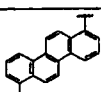
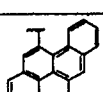
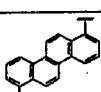
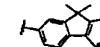
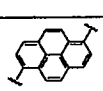
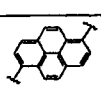
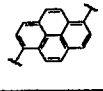
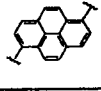
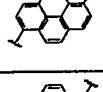
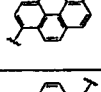
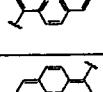
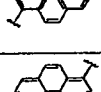
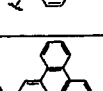
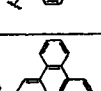
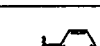
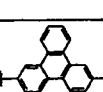
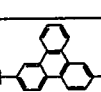
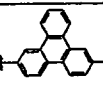
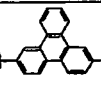
2596						
2597						
2598						
2599						
2600						
2601						
2602						
2603						
2604						
2605						
2606						
2607						
2608						
2609						
2610						
2611						
2612						

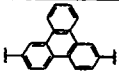
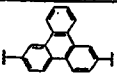
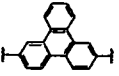
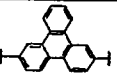
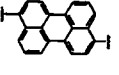
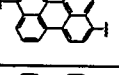
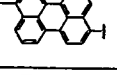
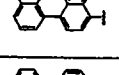
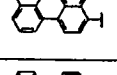
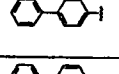
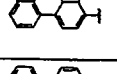
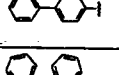
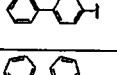
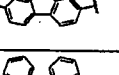
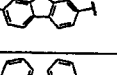
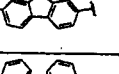
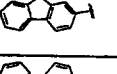
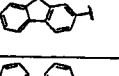
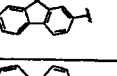
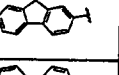
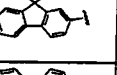
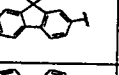
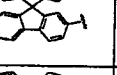
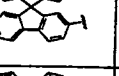
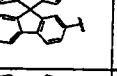
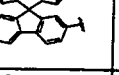
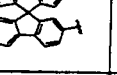
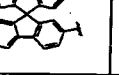
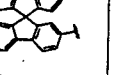
2613						
2614						
2615						
2616						
2617						
2618						
2619						
2620						
2621						
2622						
2623						
2624						
2625						
2626						
2627						

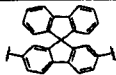
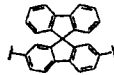
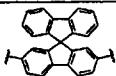
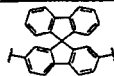
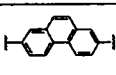
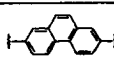
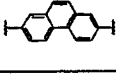
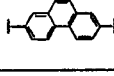
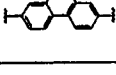
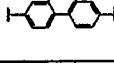
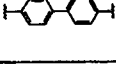
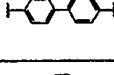
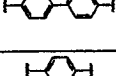
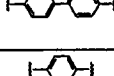
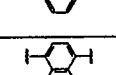
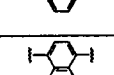
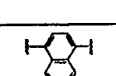
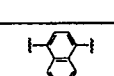
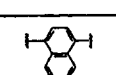
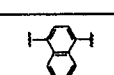
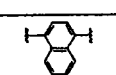
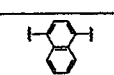
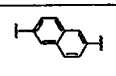
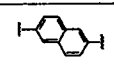
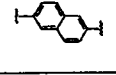
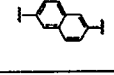
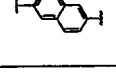
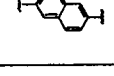
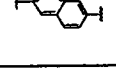
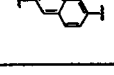
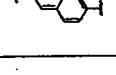
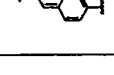
2628						
2629						
2630						
2631						
2632						
2633						
2634						
2635						
2636						
2637						
2638						
2639						

2640						
2641						
2642						
2643						
2644						
2645						
2646						
2647						
2648						
2649						
2650						
2651						
2652						

2653						
2654						
2655						
2656						
2657						
2658						
2659						
2660						
2661						
2662						
2663						
2664						
2665						

2666						
2667						
2668						
2669						
2670						
2671						
2672						
2673						
2674						
2675						
2676						
2677						
2678						
2679						

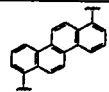
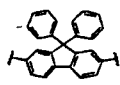
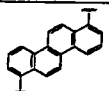
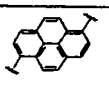
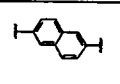
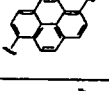
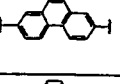
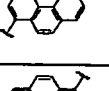
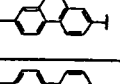
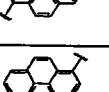
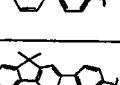
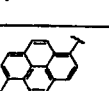
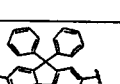
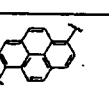
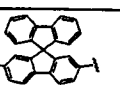
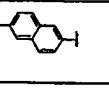
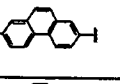
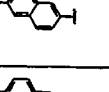
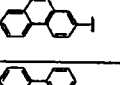
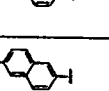
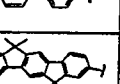
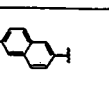
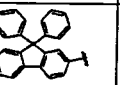
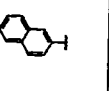
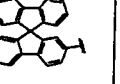
2680						
2681						
2682						
2683						
2684						
2685						
2686						
2687						
2688						
2689						
2690						
2691						
2692						
2693						
2694						

2695						
2696						
2697						
2698						
2699						
2700						
2701						
2702						
2703						
2704						
2705						
2706						
2707						
2708						
2709						
2710						
2711						



2712						
2713						
2714						
2715						
2716						
2717						
2718						
2719						
2720						
2721						
2722						
2723						
2724						
2725						
2726						
2727						

2728						
2729						
2730						
2731						
2732						
2733						
2734						
2735						
2736						
2737						
2738						
2739						
2740						
2741						

2742						
2743						
2744						
2745						
2746						
2747						
2748						
2749						
2750						
2751						
2752						
2753						
2754						
2755						
2756						

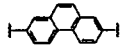
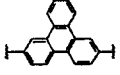
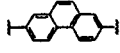
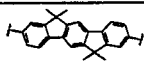
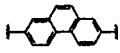
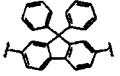
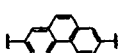
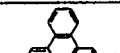
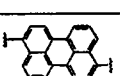
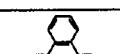
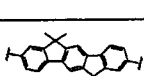
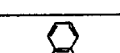
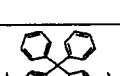
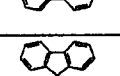
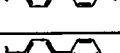
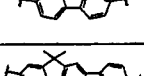
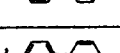
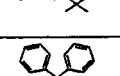
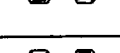
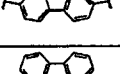
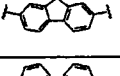
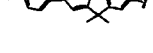
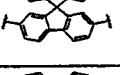
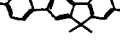
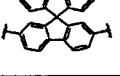
2757						
2758						
2759						
2760						
2761						
2762						
2763						
2764						
2765						
2766						
2767						
2768						
2769						
2770						
2771						



表 2

化合物	^1H NMR(CDCl ₃ , 200 MHz)	MS/FAB	
		實測值	計算值
1	$\delta = 7.83(\text{d}, 2\text{H}), 7.75(\text{d}, 2\text{H}), 7.62-7.58(\text{m}, 4\text{H}), 7.20(\text{m}, 8\text{H}), 6.81-6.75(\text{m}, 6\text{H}), 6.63-6.58(\text{m}, 10\text{H}), 1.72(\text{s}, 12\text{H})$	744.96	744.35
2	$\delta = 7.88-7.74(\text{m}, 20\text{H}), 7.62-7.49(\text{m}, 12\text{H}), 7.36(\text{m}, 4\text{H}), 6.75(\text{s}, 2\text{H}), 6.58(\text{m}, 2\text{H}), 1.72(\text{s}, 12\text{H})$	945.20	944.41
3	$\delta = 8.07-8.02(\text{m}, 8\text{H}), 7.83(\text{m}, 2\text{H}), 7.75(\text{s}, 2\text{H}), 7.62-7.53(\text{m}, 16\text{H}), 7.38(\text{m}, 4\text{H}), 6.98(\text{m}, 4\text{H}), 6.75(\text{s}, 2\text{H}), 6.58(\text{m}, 2\text{H}), 1.72(\text{s}, 12\text{H})$	945.20	944.41
5	$\delta = 7.87-7.83(\text{m}, 6\text{H}), 7.75(\text{s}, 2\text{H}), 7.62-7.55(\text{m}, 12\text{H}), 7.38(\text{m}, 4\text{H}), 7.28(\text{m}, 4\text{H}), 6.75(\text{s}, 6\text{H}), 6.58(\text{m}, 6\text{H}), 1.72(\text{s}, 36\text{H})$	1209.60	1208.60
8	$\delta = 7.83(\text{d}, 2\text{H}), 7.75(\text{d}, 2\text{H}), 7.58-7.41(\text{m}, 32\text{H}), 6.75(\text{s}, 2\text{H}), 6.69(\text{m}, 8\text{H}), 6.58(\text{m}, 2\text{H}), 1.72(\text{s}, 12\text{H})$	1049.35	1048.48
12	$\delta = 7.83(\text{d}, 2\text{H}), 7.75(\text{d}, 2\text{H}), 7.62-7.58(\text{m}, 4\text{H}), 6.98(\text{m}, 8\text{H}), 6.75(\text{s}, 2\text{H}), 6.58-6.51(\text{m}, 10\text{H}), 2.34(\text{s}, 12\text{H}), 1.72(\text{s}, 12\text{H})$	801.07	800.41
15	$\delta = 7.83(\text{d}, 2\text{H}), 7.75(\text{d}, 2\text{H}), 7.62-7.58(\text{m}, 4\text{H}), 7.01(\text{m}, 8\text{H}), 6.75(\text{m}, 2\text{H}), 6.58-6.55(\text{m}, 10\text{H}), 1.72(\text{s}, 12\text{H}), 1.35(\text{s}, 36\text{H})$	969.60	968.60
19	$\delta = 7.83(\text{d}, 2\text{H}), 7.75(\text{d}, 2\text{H}), 7.62-7.58(\text{m}, 4\text{H}), 6.75-6.71(\text{m}, 6\text{H}), 6.58(\text{m}, 2\text{H}), 6.36(\text{m}, 8\text{H}), 2.34(\text{s}, 24\text{H}), 1.72(\text{s}, 12\text{H})$	857.17	856.48
30	$\delta = 7.93-7.83(\text{m}, 10\text{H}), 7.77-7.75(\text{m}, 6\text{H}), 7.63-7.54(\text{m}, 20\text{H}), 7.38(\text{m}, 4\text{H}), 7.28(\text{m}, 4\text{H}), 6.75(\text{s}, 2\text{H}), 6.69(\text{m}, 8\text{H}), 6.58(\text{m}, 2\text{H}), 1.72(\text{s}, 36\text{H})$	1513.99	1512.73
47	$\delta = 7.88-7.74(\text{m}, 12\text{H}), 7.62-7.49(\text{m}, 8\text{H}), 7.36(\text{m}, 2\text{H}), 7.20(\text{m}, 4\text{H}), 6.81-6.75(\text{m}, 4\text{H}), 6.63-6.58(\text{m}, 6\text{H}), 1.72(\text{s}, 12\text{H})$	845.08	844.38
49	$\delta = 8.93(\text{m}, 4\text{H}), 8.12(\text{m}, 4\text{H}), 7.88-7.75(\text{m}, 12\text{H}), 7.62-7.58(\text{m}, 4\text{H}), 7.20(\text{m}, 4\text{H}), 6.91(\text{s}, 2\text{H}), 6.81-6.75(\text{m}, 4\text{H}), 6.63-6.58(\text{m}, 6\text{H}), 1.72(\text{s}, 12\text{H})$	945.20	944.41
52	$\delta = 7.83(\text{d}, 2\text{H}), 7.75(\text{d}, 2\text{H}), 7.62-$	897.15	896.41

	7.41(m, 16H), 7.20(m, 4H), 6.89-6.75(m, 8H), 6.63-6.58(m, 8H), 1.72(s, 12H)		
54	δ = 7.83(d, 2H), 7.75(d, 2H), 7.62-7.51(m, 10H), 7.41(m, 2H), 7.20-7.16(m, 6H), 7.08(m, 4H), 6.87-6.75(m, 6H), 6.69-6.58(m, 8H), 1.72(s, 12H)	897.15	896.41
57	δ = 7.83(d, 2H), 7.75(d, 2H), 7.62-7.58(m, 4H), 7.20(m, 4H), 6.98(m, 4H), 6.81(m, 4H), 6.75(s, 2H), 6.63-6.51(m, 10H), 2.34(s, 6H), 1.72(s, 12H)	773.02	772.38
60	δ = 7.83(d, 2H), 7.75(d, 2H), 7.62-7.58(m, 4H), 7.20(m, 4H), 7.01(m, 4H), 6.81-6.75(m, 4H), 6.63-6.55(m, 10H), 1.72(s, 12H), 1.35(s, 18H)	857.17	856.48
68	δ = 8.07(m, 2H), 7.83(d, 2H), 7.75(d, 2H), 7.62-7.55(m, 6H), 7.20(m, 4H), 6.81-6.58(m, 14H), 1.72(s, 12H)	746.94	746.34
75	δ = 7.93-7.83(m, 6H), 7.77-7.75(m, 4H), 7.62-7.54(m, 12H), 7.38(m, 2H), 7.28(m, 2H), 7.20(m, 4H), 6.81-6.75(m, 4H), 6.69-6.63(m, 10H), 1.72(s, 24H)	1129.47	1128.54
94	δ = 7.88-7.74(m, 14H), 7.62-7.49(m, 12H), 7.38-7.36(m, 4H), 7.28(m, 2H), 6.75(m, 4H), 56.58(m, 4H), 1.72(s, 24H)	1077.40	1076.51
98	δ = 7.88-7.74(m, 12H), 7.62-7.36(m, 18H), 7.16-7.08(m, 6H), 6.87(m, 2H), 6.75(m, 2H), 6.69(m, 2H), 6.58(m, 2H), 1.72(s, 12H)	997.27	996.44
110	δ = 7.88-7.74(m, 12H), 7.62-7.58(m, 4H), 7.50-7.49(m, 4H), 7.36(m, 2H), 7.15(m, 4H), 6.75(m, 2H), 6.61-6.58(m, 6H), 1.72(s, 12H), 0.25(s, 18H)	989.44	988.46
117	δ = 8.18(m, 2H), 8.01(m, 2H), 7.88-7.74(m, 12H), 7.62-7.49(m, 12H), 6.75(m, 2H), 6.58(m, 2H), 1.72(s, 12H)	959.23	958.32
137	δ = 8.07-8.02(m, 4H), 7.87-7.83(m, 4H), 7.75(m, 2H), 7.62-7.53(m, 14H), 7.38(m, 4H), 7.28(m, 2H), 6.98(m, 2H), 6.75(m, 4H), 6.58(m, 4H), 1.72(s, 24H)	1077.40	1076.51
161	δ = 8.07-8.02(m, 4H), 7.93(m, 2H), 7.83(m, 2H), 7.77-7.75(m, 4H), 7.63-7.51(m, 22H), 7.41-7.38(m, 4H), 6.98(m, 2H), 6.75(m, 4H), 6.58(m, 4H), 1.72(s, 24H)	1229.59	1228.57
182	δ = 8.93(m, 4H), 8.12(m, 4H), 7.88-	1097.39	1096.48

	7.75 (m, 12H), 7.62-7.41 (m, 18H), 6.91 (m, 2H), 6.75-6.69 (m, 6H), 6.58 (m, 2H), 1.72 (s, 12H)		
193	δ = 8.93 (m, 4H), 8.12 (m, 4H), 7.88-7.75 (m, 12H), 7.62-7.58 (m, 4H), 6.91 (m, 2H), 6.75-6.71 (m, 4H), 6.58 (m, 2H), 6.36 (m, 4H), 2.34 (s, 12H), 1.72 (s, 12H)	1001.30	1000.48
198	δ = 8.93 (m, 4H), 8.22 (m, 2H), 8.12 (m, 4H), 7.94-7.57 (m, 24H), 7.37 (m, 2H), 6.91 (m, 2H), 6.75 (m, 2H), 6.58 (m, 2H), 1.72 (s, 12H)	1047.29	1046.43
220	δ = 8.93 (m, 4H), 8.47 (m, 4H), 8.12 (m, 4H), 7.88-7.75 (m, 12H), 7.62-7.58 (m, 4H), 6.91 (m, 2H), 6.75 (m, 2H), 6.58 (m, 2H), 1.72 (s, 12H)	951.13	950.38
226	δ = 7.87-7.83 (m, 4H), 7.75 (m, 2H), 7.62-7.51 (m, 24H), 7.41-7.38 (m, 6H), 7.28 (m, 2H), 7.06 (m, 2H), 6.85 (m, 4H), 6.75 (m, 4H), 6.58 (m, 4H), 1.72 (s, 24H)	1281.67	1280.60
230	δ = 7.87-7.83 (m, 4H), 7.75 (m, 2H), 7.62-7.55 (m, 8H), 7.38 (m, 2H), 7.28 (m, 2H), 7.01 (m, 4H), 6.75 (m, 4H), 6.58-6.55 (m, 8H), 1.72 (s, 24H), 1.35 (s, 18H)	1089.49	1088.60
240	δ = 8.28 (m, 2H), 8.17 (m, 2H), 7.87-7.83 (m, 4H), 7.75 (m, 2H), 7.62-7.55 (m, 10H), 7.47-7.38 (m, 6H), 7.28 (m, 2H), 6.99 (m, 2H), 6.75 (m, 4H), 6.58 (m, 4H), 1.72 (s, 24H)	1079.38	1078.50
243	δ = 8.18 (m, 2H), 8.01 (m, 2H), 7.87-7.83 (m, 4H), 7.75 (m, 2H), 7.62-7.53 (m, 12H), 7.38 (m, 2H), 7.28 (m, 2H), 6.75 (m, 4H), 6.58 (m, 4H), 1.72 (s, 24H)	1091.43	1090.41
263	δ = 8.12 (m, 4H), 7.88-7.82 (m, 10H), 7.75-7.71 (m, 6H), 7.62-7.51 (m, 16H), 7.41 (m, 2H), 6.91 (m, 2H), 6.75-6.69 (m, 6H), 6.58 (m, 2H), 1.72 (s, 12H)	1145.43	1144.48
278	δ = 8.12-8.07 (m, 6H), 7.88-7.82 (m, 10H), 7.75-7.71 (m, 6H), 7.62-7.55 (m, 6H), 6.91 (m, 2H), 6.75-6.58 (m, 8H), 1.72 (s, 12H)	995.22	994.40
302	δ = 7.83 (m, 2H), 7.75 (m, 2H), 7.62-7.41 (m, 30H), 6.89-6.88 (m, 4H), 6.75 (m, 2H), 6.69 (m, 4H), 6.59-6.58 (m, 4H), 1.72 (s, 12H)	1049.35	1048.48
306	δ = 7.83 (m, 2H), 7.75 (m, 2H), 7.62-	925.21	924.44

	7.41 (m, 16H), 6.98 (m, 4H), 6.88 (m, 4H), 6.75 (m, 2H), 6.59-6.51 (m, 8H), 2.34 (s, 6H), 1.72 (s, 12H)		
313	δ = 7.83 (m, 2H), 7.75 (m, 2H), 7.62-7.41 (m, 16H), 6.89-6.88 (m, 4H), 6.75-6.71 (m, 4H), 6.59-6.58 (m, 4H), 6.36 (m, 4H), 2.34 (s, 12H), 1.72 (s, 12H)	953.26	952.48
344	δ = 7.83 (m, 2H), 7.75 (m, 2H), 7.62-7.51 (m, 16H), 7.41 (m, 2H), 6.98 (m, 4H), 6.75-6.69 (m, 6H), 6.58-6.51 (m, 6H), 2.34 (s, 6H), 1.72 (s, 12H)	925.21	924.44
347	δ = 7.83 (m, 2H), 7.75 (m, 2H), 7.62-7.51 (m, 16H), 7.41 (m, 2H), 7.01 (m, 4H), 6.75 (m, 2H), 6.69 (m, 4H), 6.58-6.55 (m, 6H), 1.72 (s, 12H), 1.35 (s, 18H)	1009.37	1008.54
351	δ = 7.83 (m, 2H), 7.75 (m, 2H), 7.62-7.51 (m, 16H), 7.41 (m, 2H), 6.75-6.69 (m, 8H), 6.58 (m, 2H), 6.36 (m, 4H), 2.34 (s, 12H), 1.72 (s, 12H)	953.26	952.48
354	δ = 7.83-7.75 (m, 12H), 7.62-7.41 (m, 32H), 6.95 (m, 2H), 6.75-6.65 (m, 8H), 6.58 (m, 2H), 1.72 (s, 12H)	1201.54	1200.54
389	δ = 7.83 (m, 2H), 7.75 (m, 2H), 7.62-7.37 (m, 20H), 6.88 (m, 4H), 6.75 (m, 2H), 6.59-6.56 (m, 8H), 1.72 (s, 12H)	1033.15	1032.39
398	δ = 7.93 (m, 2H), 7.83 (m, 2H), 7.77-7.75 (m, 4H), 7.63-7.41 (m, 30H), 6.88 (m, 4H), 6.75 (m, 4H), 6.59-6.58 (m, 6H), 1.72 (s, 24H)	1281.67	1280.60
420	δ = 7.91 (m, 6H), 7.83 (m, 2H), 7.75 (m, 2H), 7.62-7.58 (m, 4H), 7.39-7.35 (m, 14H), 7.01 (m, 4H), 6.75 (m, 2H), 6.58-6.51 (m, 8H), 1.72 (s, 12H), 1.35 (s, 18H)	1205.57	1204.57
421	δ = 7.91 (m, 6H), 7.83 (m, 2H), 7.75 (m, 2H), 7.62-7.58 (m, 4H), 7.39-7.35 (m, 14H), 6.75-6.74 (m, 6H), 6.58-6.51 (m, 8H), 3.85 (s, 6H), 1.72 (s, 12H)	1153.41	1152.47
457	δ = 7.83 (m, 2H), 7.75 (m, 2H), 7.62-7.41 (m, 24H), 7.06 (m, 2H), 6.85 (m, 4H), 6.75 (m, 2H), 6.58 (m, 2H), 6.24 (m, 4H), 2.34 (s, 12H), 2.18 (s, 6H), 1.72 (s, 12H)	1133.51	1132.57
466	δ = 7.83-7.75 (m, 6H), 7.58-7.41 (m, 22H), 7.15 (m, 2H), 7.05 (m, 4H), 6.95 (m, 2H), 6.78 (m, 2H), 3.65 (m, 8H), 6.11 (m, 8H), 1.72 (s, 12H)	1067.36	1066.52

489	$\delta = 7.83(\text{m}, 2\text{H}), 7.75(\text{m}, 2\text{H}), 7.62-7.50(\text{m}, 4\text{H}), 7.01-6.98(\text{m}, 8\text{H}), 6.75(\text{m}, 2\text{H}), 6.58-6.51(\text{m}, 10\text{H}), 2.34(\text{s}, 6\text{H}), 1.72(\text{s}, 12\text{H}), 1.35(\text{s}, 18\text{H})$	885.23	884.51
493	$\delta = 7.83(\text{m}, 2\text{H}), 7.75(\text{m}, 2\text{H}), 7.2-7.58(\text{m}, 4\text{H}), 6.98(\text{m}, 4\text{H}), 6.75-6.71(\text{m}, 4\text{H}), 6.58(\text{m}, 2\text{H}), 6.51(\text{m}, 4\text{H}), 6.36(\text{m}, 4\text{H}), 2.34(\text{s}, 18\text{H}), 1.72(\text{s}, 12\text{H})$	829.12	828.44
511	$\delta = 8.46(\text{m}, 4\text{H}), 7.83(\text{m}, 2\text{H}), 7.75(\text{m}, 2\text{H}), 7.62-7.58(\text{m}, 4\text{H}), 6.98(\text{m}, 8\text{H}), 6.75(\text{m}, 2\text{H}), 6.71-6.51(\text{m}, 6\text{H}), 2.34(\text{s}, 6\text{H}), 1.72(\text{s}, 12\text{H})$	774.99	774.37
528	$\delta = 7.83(\text{m}, 2\text{H}), 7.75(\text{m}, 2\text{H}), 7.62-7.58(\text{m}, 4\text{H}), 7.15(\text{m}, 4\text{H}), 6.99(\text{m}, 4\text{H}), 6.75(\text{m}, 2\text{H}), 6.61(\text{m}, 10\text{H}), 1.72(\text{s}, 12\text{H}), 0.25(\text{s}, 18\text{H})$	925.31	924.41
537	$\delta = 7.93-7.83(\text{m}, 6\text{H}), 7.77-7.75(\text{m}, 4\text{H}), 7.63-7.55(\text{m}, 12\text{H}), 7.38(\text{m}, 2\text{H}), 7.28(\text{m}, 2\text{H}), 6.99(\text{m}, 4\text{H}), 6.75(\text{m}, 2\text{H}), 6.69(\text{m}, 4\text{H}), 6.61-6.58(\text{m}, 6\text{H}), 1.72(\text{s}, 24\text{H})$	1165.45	1164.52
554	$\delta = 7.83(\text{m}, 2\text{H}), 7.75(\text{m}, 2\text{H}), 7.62-7.58(\text{m}, 4\text{H}), 7.01(\text{m}, 4\text{H}), 6.86(\text{m}, 2\text{H}), 6.75(\text{m}, 2\text{H}), 6.58-6.55(\text{m}, 6\text{H}), 6.43(\text{m}, 2\text{H}), 6.32(\text{m}, 2\text{H}), 2.34(\text{s}, 12\text{H}), 1.72(\text{s}, 12\text{H}), 1.35(\text{s}, 18\text{H})$	913.28	912.54
558	$\delta = 7.83(\text{m}, 2\text{H}), 7.759\text{m}, 2\text{H}), 7.62-7.58(\text{m}, 4\text{H}), 6.86(\text{m}, 2\text{H}), 6.75-6.71(\text{m}, 4\text{H}), 6.58(\text{m}, 2\text{H}), 6.43(\text{m}, 2\text{H}), 6.36-6.32(\text{m}, 6\text{H}), 2.34(\text{s}, 24\text{H}), 1.72(\text{s}, 12\text{H})$	857.17	856.48
568	$\delta = 7.93(\text{m}, 2\text{H}), 7.83(\text{m}, 2\text{H}), 7.77-7.75(\text{m}, 4\text{H}), 7.63-7.51(\text{m}, 16\text{H}), 7.41(\text{m}, 2\text{H}), 6.86(\text{m}, 2\text{H}), 6.75(\text{m}, 4\text{H}), 6.58(\text{m}, 4\text{H}), 6.43(\text{m}, 2\text{H}), 6.32(\text{m}, 2\text{H}), 2.34(\text{s}, 12\text{H}), 1.72(\text{s}, 24\text{H})$	1185.58	1184.60
571	$\delta = 8.55(\text{m}, 2\text{H}), 8.42(\text{m}, 2\text{H}), 8.08-8.04(\text{m}, 4\text{H}), 7.93(\text{m}, 2\text{H}), 7.83(\text{m}, 2\text{H}), 7.77-7.75(\text{m}, 4\text{H}), 7.63-7.55(\text{m}, 14\text{H}), 6.86(\text{m}, 2\text{H}), 6.75(\text{m}, 4\text{H}), 6.58(\text{m}, 4\text{H}), 6.43(\text{m}, 2\text{H}), 6.32(\text{m}, 2\text{H}), 2.34(\text{s}, 12\text{H}), 1.72(\text{s}, 24\text{H})$	1285.70	1284.63

617	$\delta = 7.83(\text{m}, 2\text{H}), 7.75(\text{m}, 2\text{H}), 7.62-7.58(\text{m}, 4\text{H}), 6.75-6.74(\text{m}, 6\text{H}), 6.52(\text{m}, 6\text{H}), 6.24(\text{s}, 4\text{H}), 3.83(\text{s}, 6\text{H}), 2.34(\text{s}, 12\text{H}), 2.18(\text{s}, 6\text{H}), 1.72(\text{s}, 12\text{H})$	889.17	888.47
681	$\delta = 8.22(\text{m}, 2\text{H}), 7.94(\text{m}, 2\text{H}), 7.83(\text{m}, 2\text{H}), 7.75-7.57(\text{m}, 12\text{H}), 7.37(\text{m}, 2\text{H}), 6.75(\text{m}, 2\text{H}), 6.58(\text{m}, 2\text{H}), 6.22(\text{s}, 2\text{H}), 2.34(\text{s}, 12\text{H}), 2.12(\text{s}, 12\text{H}), 1.72(\text{s}, 12\text{H})$	959.27	958.50
711	$\delta = 8.42(\text{m}, 4\text{H}), 8.10(\text{m}, 4\text{H}), 7.83(\text{m}, 2\text{H}), 7.75(\text{m}, 2\text{H}), 7.67-7.49(\text{m}, 10\text{H}), 7.34(\text{m}, 2\text{H}), 6.91(\text{m}, 2\text{H}), 6.75-6.71(\text{m}, 4\text{H}), 6.58(\text{m}, 2\text{H}), 6.36(\text{m}, 4\text{H}), 2.34(\text{s}, 12\text{H}), 1.72(\text{s}, 12\text{H})$	1049.35	1048.35
741	$\delta = 8.55(\text{m}, 2\text{H}), 8.42(\text{m}, 2\text{H}), 8.08-8.04(\text{m}, 4\text{H}), 7.93(\text{m}, 2\text{H}), 7.77-7.75(\text{m}, 4\text{H}), 7.63-7.55(\text{m}, 14\text{H}), 7.37(\text{m}, 4\text{H}), 6.75(\text{m}, 4\text{H}), 6.58-6.56(\text{m}, 8\text{H}), 1.72(\text{s}, 24\text{H})$	1365.59	1364.54
757	$\delta = 8.07(\text{m}, 2\text{H}), 7.83(\text{m}, 2\text{H}), 7.75(\text{m}, 2\text{H}), 7.62-7.55(\text{m}, 6\text{H}), 7.15(\text{m}, 4\text{H}), 6.75-6.70(\text{m}, 4\text{H}), 6.62-6.58(\text{m}, 8\text{H}), 1.72(\text{s}, 12\text{H}), 0.25(\text{s}, 18\text{H})$	891.30	890.42
764	$\delta = 7.93-7.83(\text{m}, 6\text{H}), 7.77-7.75(\text{m}, 4\text{H}), 7.63-7.54(\text{m}, 12\text{H}), 7.38(\text{m}, 2\text{H}), 7.28(\text{m}, 2\text{H}), 7.15(\text{m}, 4\text{H}), 6.75(\text{m}, 2\text{H}), 6.69(\text{m}, 4\text{H}), 6.61-6.58(\text{m}, 6\text{H}), 1.72(\text{s}, 24\text{H}), 0.25(\text{s}, 18\text{H})$	1273.84	1272.62
805	$\delta = 8.22(\text{m}, 2\text{H}), 8.07(\text{m}, 2\text{H}), 7.94(\text{m}, 2\text{H}), 7.83(\text{m}, 2\text{H}), 7.75-7.55(\text{m}, 14\text{H}), 7.37(\text{m}, 2\text{H}), 6.70-6.58(\text{m}, 8\text{H}), 1.72(\text{s}, 12\text{H})$	849.03	849.36
832	$\delta = 8.22(\text{m}, 2\text{H}), 7.94-7.93(\text{m}, 4\text{H}), 7.83(\text{m}, 2\text{H}), 7.75-7.51(\text{m}, 26\text{H}), 7.41-7.37(\text{m}, 4\text{H}), 6.75(\text{m}, 4\text{H}), 6.58(\text{m}, 4\text{H}), 1.72(\text{s}, 24\text{H})$	1231.57	1230.56

881	$\delta = 8.46(m, 4H), 7.83-7.75(m, 6H), 7.58(m, 2H), 6.99-6.93(m, 6H), 6.78(m, 2H), 3.65(m, 8H), 3.11(m, 8H), 1.72(s, 12H)$	764.96	764.38
910	$\delta = 8.18(m, 2H), 8.01(m, 2H), 7.93-7.83(m, 6H), 7.77-7.75(m, 4H), 7.63-7.53(m, 16H), 7.38(m, 2H), 7.28(m, 2H), 6.75(m, 2H), 6.69(m, 4H), 6.58(m, 2H), 1.72(s, 24H)$	1243.62	1242.47
928	$\delta = 7.93-7.83(m, 8H), 7.77-7.75(m, 6H), 7.63-7.51(m, 24H), 7.41-7.38(m, 4H), 7.28(m, 2H), 6.75(m, 4H), 6.69(m, 4H), 6.58(m, 4H), 1.72(s, 36H)$	1513.99	1512.73
1004	$\delta = 8.99-8.93(m, 4H), 8.34(m, 2H), 8.12-8.10(m, 4H), 8.00-7.71(m, 24H), 7.63-7.54(m, 18H), 6.75-6.69(m, 8H), 6.58(m, 4H), 1.72(s, 24H)$	1582.02	1580.69
1047	$\delta = 8.90(m, 2H), 8.50-8.45(m, 8H), 7.83(m, 2H), 7.75(m, 2H), 7.62-7.58(m, 4H), 6.93(m, 2H), 6.58(m, 2H), 1.72(s, 12H)$	752.87	752.31
1081	$\delta = 7.83(m, 1H), 7.75(m, 1H), 7.62-7.58(m, 2H), 7.34(m, 2H), 7.20(m, 8H), 6.81-6.75(m, 6H), 6.63-6.59(m, 10H), 1.72(s, 6H)$	628.80	628.29
1082	$\delta = 7.88-7.74(m, 18H), 7.62-7.49(m, 10H), 7.36-7.34(m, 6H), 6.75(m, 1H), 6.58(m, 3H), 1.72(s, 6H)$	829.04	828.35
1083	$\delta = 8.07-8.02(m, 8H), 7.83(m, 1H), 7.75(m, 1H), 7.62-7.53(m, 14H), 7.38-7.34(m, 6H), 6.98(m, 4H), 6.75(m, 1H), 6.59(m, 3H), 1.72(s, 6H)$	829.04	828.35
1085	$\delta = 7.87-7.83(m, 5H), 7.75(m, 1H), 7.62-7.55(m, 10H), 7.38-7.28(m, 10H), 6.75(m, 5H), 6.58(m, 7H), 1.72(s, 30H)$	1093.44	1092.54

1088	$\delta = 7.83(\text{m}, 1\text{H}), 7.75(\text{m}, 1\text{H}), 7.62-7.41(\text{m}, 32\text{H}), 6.75(\text{m}, 1\text{H}), 6.59(\text{m}, 8\text{H}), 6.58(\text{m}, 3\text{H}), 1.72(\text{s}, 6\text{H})$	933.19	932.41
1092	$\delta = 7.83(\text{m}, 1\text{H}), 7.75(\text{m}, 1\text{H}), 7.62-7.58(\text{m}, 2\text{H}), 7.34(\text{m}, 2\text{H}), 6.98(\text{m}, 8\text{H}), 6.75(\text{m}, 1\text{H}), 6.58-6.51(\text{m}, 11\text{H}), 2.34(\text{s}, 12\text{H}), 1.72(\text{s}, 6\text{H})$	684.91	684.35
1093	$\delta = 7.83(\text{m}, 1\text{H}), 7.75(\text{m}, 1\text{H}), 7.62-7.58(\text{m}, 2\text{H}), 7.34(\text{m}, 2\text{H}), 6.99(\text{m}, 8\text{H}), 6.75(\text{m}, 1\text{H}), 6.61-6.58(\text{m}, 11\text{H}), 1.72(\text{s}, 6\text{H})$	700.76	700.25
1095	$\delta = 7.83(\text{m}, 1\text{H}), 7.75(\text{m}, 1\text{H}), 7.62-7.58(\text{m}, 2\text{H}), 7.34(\text{m}, 2\text{H}), 7.01(\text{m}, 8\text{H}), 6.75(\text{m}, 1\text{H}), 6.58-6.55(\text{m}, 11\text{H}), 1.72(\text{s}, 6\text{H}), 1.35(\text{s}, 36\text{H})$	853.23	852.54
1104	$\delta = 8.22(\text{m}, 4\text{H}), 7.94(\text{m}, 4\text{H}), 7.83(\text{m}, 1\text{H}), 7.75-7.57(\text{m}, 15\text{H}), 7.37-7.34(\text{m}, 6\text{H}), 6.75(\text{m}, 1\text{H}), 6.58(\text{m}, 3\text{H}), 1.72(\text{s}, 6\text{H})$	832.99	832.33
1127	$\delta = 7.88-7.74(\text{m}, 10\text{H}), 7.62-7.49(\text{m}, 6\text{H}), 7.36-7.34(\text{m}, 4\text{H}), 7.20(\text{m}, 4\text{H}), 6.81-6.75(\text{m}, 3\text{H}), 6.63-6.58(\text{m}, 7\text{H}), 1.72(\text{s}, 6\text{H})$	728.92	728.32
1128	$\delta = 8.07-8.02(\text{m}, 4\text{H}), 7.83(\text{m}, 1\text{H}), 7.75(\text{m}, 1\text{H}), 7.62-7.53(\text{m}, 8\text{H}), 7.38-7.34(\text{m}, 4\text{H}), 7.20(\text{m}, 4\text{H}), 6.98(\text{m}, 2\text{H}), 6.81-6.75(\text{m}, 3\text{H}), 6.63-6.58(\text{m}, 7\text{H}), 1.72(\text{s}, 6\text{H})$	728.92	728.32
1136	$\delta = 7.83(\text{m}, 1\text{H}), 7.75(\text{m}, 1\text{H}), 7.62-7.34(\text{m}, 24\text{H}), 7.20(\text{m}, 4\text{H}), 7.06(\text{m}, 2\text{H}), 6.85-6.81(\text{m}, 7\text{H}), 6.63-6.58(\text{m}, 7\text{H}), 1.72(\text{s}, 6\text{H})$	933.19	932.41
1140	$\delta = 7.83(\text{m}, 1\text{H}), 7.75(\text{m}, 1\text{H}), 7.62-7.58(\text{m}, 2\text{H}), 7.34(\text{m}, 2\text{H}), 7.20(\text{m}, 4\text{H}), 7.01(\text{m}, 4\text{H}), 6.81-6.75(\text{m}, 3\text{H}), 6.63-$	741.01	740.41

	6.55(m, 11H), 1.72(s, 6H), 1.35(s, 18H)		
1142	δ = 7.83(m, 1H), 7.75(m, 1H), 7.62-7.58(m, 2H), 7.34(m, 2H), 7.20(m, 4H), 6.81-6.75(m, 3H), 6.63-6.58(m, 7H), 6.24(m, 4H), 2.34(s, 12H), 2.18(s, 6H), 1.72(s, 6H)	712.96	712.38
1154	δ = 7.93(m, 2H), 7.83(m, 1H), 7.77-7.75(m, 3H), 7.63-7.51(m, 14H), 7.41-7.34(m, 4H), 7.20(m, 4H), 6.81-6.75(m, 5H), 1.72(s, 18H)	1013.31	1012.48
1159	δ = 8.00-7.92(m, 8H), 7.83(m, 1H), 7.77-7.73(m, 5H), 7.63-7.58(m, 12H), 7.34(m, 2H), 7.20(m, 4H), 6.81-6.75(m, 5H), 6.63-6.58(m, 9H), 1.72(s, 18H)	1113.43	1112.51
1174	δ = 7.88-7.759m, 12H), 7.62-7.49(m, 10H), 7.38-7.28(m, 8H), 6.75(m, 3H), 6.58(m, 5H), 1.72(s, 18H)	961.24	960.44
1177	δ = 7.88-7.74(m, 10H), 7.62-7.36(m, 24H), 6.75(m, 1H), 6.69(m, 4H), 6.59-6.58(m, 3H), 1.72(s, 6H)	880.11	880.38
1180	δ = 7.88-7.74(m, 10H), 7.62-7.34(m, 30H), 7.06(m, 2H), 6.85(m, 4H), 6.75(m, 1H), 6.59-6.58(m, 3H), 1.72(s, 6H)	1033.30	1032.44
1181	δ = 7.88-7.74(m, 10H), 7.62-7.49(m, 6H), 7.36-7.34(m, 4H), 6.99(m, 4h), 6.75(m, 1h), 6.61-6.58(m, 7H), 1.72(s, 6H)	756.97	756.35
1182	δ = 7.88-7.74(m, 10H), 7.62-7.49(m, 6H), 7.36-7.34(m, 4H), 6.99(m, 4H), 6.75(m, 1H), 6.61-6.58(m, 7H), 1.72(s, 6H)	764.90	764.30
1184	δ = 7.88-7.74(m, 10H), 7.62-7.58(m, 2H), 7.50-7.49(m, 4H), 7.36-7.34(m, 4H), 7.01(m, 4H), 6.75(m, 1h),	841.13	840.44

	6.58-6.55(m, 7H), 1.72(s, 6H), 1.35(s, 18H)		
1185	δ = 7.88-7.74(m, 10H), 7.62-7.49(m, 6H), 7.36-7.34(m, 4H), 6.75-6.74(m, 5H), 6.59-6.52(m, 7H), 3.83(s, 6H), 1.72(s, 6H)	788.97	788.34
1189	δ = 7.88-7.74(m, 10H), 7.62-7.49(m, 6H), 7.37-7.34(m, 8H), 6.75(m, 1H), 6.59-6.56(m, 7H), 1.72(s, 6H)	864.92	864.29
1190	δ = 7.88-7.74(m, 10H), 7.62-7.58(m, 2H), 7.50-7.49(m, 4H), 7.36-7.34(m, 4H), 7.15(m, 4H), 6.75(m, 1H), 6.61-6.59(m, 7H), 1.72(s, 6H), 0.25(s, 18H)	873.28	872.40
1192	δ = 8.07(m, 2H), 7.88-7.74(m, 10H), 7.62-7.49(m, 8H), 7.36-7.34(m, 4H), 6.75-6.58(m, 8H), 1.72(s, 6H)	730.90	730.31
1197	δ = 8.18(m, 2H), 8.01(m, 2H), 7.88-7.74(m, 10H), 7.58-7.49(m, 10H), 7.36-7.34(m, 4H), 6.75(m, 1H), 6.59-6.58(m, 3H), 1.72(s, 6H)	843.07	842.25
1221	δ = 8.07-8.02(m, 4H), 7.83(m, 1H), 7.75(m, 1H), 7.62-7.38(m, 20H), 7.16-7.08(m, 6H), 6.98(m, 2H), 6.87(m, 2H), 6.75-6.69(m, 3H), 6.58(m, 3H), 1.72(s, 6H)	881.11	880.38
1227	δ = 8.07-7.02(m, 4H), 7.83(m, 1H), 7.75(m, 1H), 7.62-7.53(m, 8H), 7.38-7.34(m, 4H), 7.01-6.98(m, 6H), 6.75(m, 1H), 6.59-6.55(m, 7H), 1.72(s, 6H), 1.35(s, 18H)	841.13	840.44
1248	δ = 8.99-8.93(m, 4H), 8.34(m, 2H), 8.12-8.02(m, 8H), 7.88-7.38(m, 34H), 6.98(m, 2H), 6.75(m, 1H), 6.59-6.58(m, 3H), 1.72(s, 6H)	1181.46	1180.48
1259	δ = 8.93(m, 4H), 8.12(m, 4H), 7.88-	1061.36	1060.48

	7.75 (m, 12H), 7.62-7.55 (m, 6H), 7.38-7.28 (m, 6H), 6.91 (m, 2H), 6.75 (m, 3H), 6.58 (m, 5H), 1.72 (s, 18H)		
1266	δ = 8.93 (m, 4H), 8.12 (m, 4H), 7.88-7.75 (m, 10H), 7.62-7.58 (m, 2H), 7.34 (m, 2H), 6.98-6.91 (m, 6H), 6.75 (m, 1H), 6.59-6.51 (m, 7H), 2.34 (s, 6H), 1.72 (s, 6H)	857.09	856.38
1272	δ = 8.93 (m, 4H), 8.12 (m, 4H), 7.88-7.75 (m, 10H), 7.62-7.58 (m, 2H), 7.34 (m, 2H), 6.91 (m, 2H), 6.75 (m, 1H), 6.59 (m, 3H), 6.22 (m, 2H), 2.34 (s, 12H), 2.12 (s, 12H), 1.72 (s, 6H)	941.25	940.48
1297	δ = 8.93 (m, 4H), 8.12 (m, 4H), 7.88-7.75 (m, 10H), 7.62-7.58 (m, 2H), 7.34 (m, 2H), 6.91-6.84 (m, 4H), 6.75-6.72 (m, 3H), 6.59-6.58 (m, 3H), 6.01 (m, 2H), 1.72 (s, 6H)	841.09	840.26
1314	δ = 7.87-7.83 (m, 3H), 7.75 (m, 1H), 7.62-7.55 (m, 6H), 7.38-7.28 (m, 6H), 6.75-6.71 (m, 5H), 6.58 (m, 5H), 6.36 (m, 4H), 2.34 (s, 12H), 1.72 (s, 18H)	917.23	916.48
1348	δ = 7.83 (m, 1H), 7.75 (m, 1H), 7.62-7.58 (m, 2H), 7.34 (m, 2H), 7.20 (m, 4H), 6.81-6.71 (m, 9H), 6.64-6.58 (m, 13H), 6.39-6.23 (m, 6H), 3.66 (m, 4H), 1.72 (s, 6H)	881.11	880.38
1382	δ = 7.83 (m, 1H), 7.75 (m, 1H), 7.62-7.41 (m, 30H), 6.89-6.88 (m, 4H), 6.75 (m, 1H), 6.69 (m, 4H), 6.59-6.58 (m, 5H), 1.72 (s, 6H)	933.19	932.41
1386	δ = 7.83 (m, 1H), 7.75 (m, 1H), 7.62-7.41 (m, 16H), 6.98 (m, 4H), 6.89-6.88 (m, 4H), 6.75 (m, 1H), 6.59-6.51 (m, 9H), 2.34 (s, 6H), 1.72 (s, 6H)	809.05	808.38

1390	$\delta = 7.83(\text{m}, 1\text{H}), 7.75(\text{m}, 1\text{H}), 7.62-7.41(\text{m}, 16\text{H}), 6.88(\text{m}, 4\text{H}), 6.75(\text{m}, 5\text{H}), 6.59-6.52(\text{m}, 9\text{H}), 3.83(\text{s}, 6\text{H}), 1.72(\text{s}, 6\text{H})$	841.05	840.37
1400	$\delta = 7.83-7.75(\text{m}, 3\text{H}), 7.62-7.41(\text{m}, 15\text{H}), 7.09(\text{m}, 2\text{H}), 6.97-6.95(\text{m}, 3\text{H}), 6.79(\text{m}, 5\text{H}), 3.65(\text{m}, 8\text{H}), 3.11(\text{m}, 8\text{H}), 1.72(\text{s}, 6\text{H})$	799.01	798.39
1405	$\delta = 8.49(\text{m}, 2\text{H}), 8.07(\text{m}, 2\text{H}), 7.93-7.75(\text{m}, 10\text{H}), 7.62-7.41(\text{m}, 28\text{H}), 7.04(\text{m}, 2\text{H}), 6.88(\text{m}, 4\text{H}), 6.75(\text{m}, 1\text{H}), 6.59(\text{m}, 5\text{H}), 1.72(\text{s}, 18\text{H})$	1265.62	1264.57
1429	$\delta = 7.83(\text{m}, 1\text{H}), 7.62-7.51(\text{m}, 14\text{H}), 7.41-7.34(\text{m}, 4\text{H}), 6.75(\text{m}, 1\text{H}), 6.69(\text{m}, 4\text{H}), 6.58(\text{m}, 3\text{H}), 6.24(\text{m}, 4\text{H}), 2.34(\text{s}, 12\text{H}), 2.18(\text{s}, 6\text{H}), 1.72(\text{s}, 6\text{H})$	865.15	864.44
1462	$\delta = 7.83(\text{m}, 1\text{H}), 7.75(\text{m}, 1\text{H}), 7.62-7.51(\text{m}, 8\text{H}), 7.41-7.34(\text{m}, 4\text{H}), 7.16-6.99(\text{m}, 10\text{H}), 6.87(\text{m}, 2\text{H}), 6.69-6.58(\text{m}, 10\text{H}), 1.72(\text{s}, 6\text{H})$	816.97	816.33
1479	$\delta = 7.93-7.83(\text{m}, 5\text{H}), 7.77-7.75(\text{m}, 3\text{H}), 7.63-7.51(\text{m}, 16\text{H}), 7.41-7.28(\text{m}, 8\text{H}), 7.16(\text{m}, 2\text{H}), 7.08(\text{m}, 4\text{H}), 6.87(\text{m}, 2\text{H}), 6.75(\text{m}, 1\text{H}), 6.69(\text{m}, 6\text{H}), 6.58(\text{m}, 3\text{H}), 1.72(\text{s}, 18\text{H})$	1165.51	1164.54
1500	$\delta = 8.42(\text{m}, 4\text{H}), 8.10(\text{m}, 4\text{H}), 7.83(\text{m}, 1\text{H}), 7.75(\text{m}, 1\text{H}), 7.62-7.49(\text{m}, 8\text{H}), 7.34(\text{m}, 4\text{H}), 7.01(\text{m}, 4\text{H}), 6.91(\text{m}, 2\text{H}), 6.75(\text{m}, 1\text{H}), 6.59-6.55(\text{m}, 7\text{H}), 1.72(\text{s}, 6\text{H}), 1.35(\text{s}, 18\text{H})$	989.29	988.48
1533	$\delta = 7.83(\text{m}, 1\text{H}), 7.75(\text{m}, 1\text{H}), 7.62-7.41(\text{m}, 24\text{H}), 7.06-6.99(\text{m}, 6\text{H}), 6.85(\text{m}, 4\text{H}), 6.75(\text{m}, 1\text{H}), 6.61-6.58(\text{m}, 7\text{H}), 1.72(\text{s}, 6\text{H})$	969.17	968.39
1569	$\delta = 7.83(\text{m}, 1\text{H}), 7.75(\text{m}, 1\text{H}), 7.62-$	769.07	768.44

	7.58(m, 2H), 7.34(m, 2H), 7.01-6.98(m, 8H), 6.75(m, 1H), 6.58-6.51(m, 11H), 2.34(s, 6H), 1.72(s, 6H), 1.35(s, 18H)		
1606	δ = 7.83(m, 1H), 7.75(m, 1H), 7.62-7.58(m, 2H), 7.34(m, 2H), 6.99(m, 4H), 6.75-6.71(m, 3H), 6.61-6.58(m, 7H), 6.36(m, 4H), 2.34(s, 12H), 1.72(s, 6H)	720.89	720.33
1739	δ = 7.93-7.83(m, 5H), 7.77-7.75(m, 3H), 7.63-7.54(m, 10H), 7.38-7.28(m, 6H), 6.75-6.69(m, 5H), 6.58(m, 3H), 6.24(s, 4H), 2.34(s, 12H), 2.18(s, 6H), 1.72(s, 18H)	1097.47	1096.57
1757	δ = 7.83(m, 1H), 7.74(m, 1H), 7.62-7.58(m, 2H), 7.37-7.34(m, 6H), 6.75(m, 1H), 6.58-6.56(m, 7H), 6.22(s, 2H), 2.34(s, 12H), 2.12(s, 12H), 1.72(s, 6H)	877.01	876.39
1793	δ = 7.93(m, 2H), 7.83(m, 1H), 7.77-7.75(m, 3H), 7.62-7.51(m, 14H), 7.41-7.34(m, 4H), 6.75-6.71(m, 5H), 6.58(m, 5H), 6.36(m, 4H), 2.34(s, 12H), 1.72(s, 18H)	1069.42	1068.54
1844	δ = 7.93-7.83(m, 5H), 7.77-7.75(m, 3H), 7.62-7.54(m, 10H), 7.38-7.28(m, 6H), 7.15(m, 4H), 6.75-6.69(m, 5H), 6.61-6.58(m, 7H), 1.72(s, 18H), 0.25(s, 18H)	1157.68	1156.55
1933	δ = 8.28(m, 2H), 8.17(m, 2H), 7.93(m, 2H), 7.83(m, 1H), 7.77-7.75(m, 3H), 7.62-7.41(m, 24H), 6.99(m, 2H), 6.75(m, 3H), 6.59-6.58(m, 5H), 1.72(s, 18H)	1115.41	1114.50
2008	δ = 7.93-7.83(m, 7H), 7.77-7.75(m, 5H), 7.63-7.51(m, 22H), 7.41-7.28(m, 8H), 6.75(m, 3H), 6.69(m, 4H), 6.58(m, 5H), 14.72(s, 30H)	1397.83	1396.66

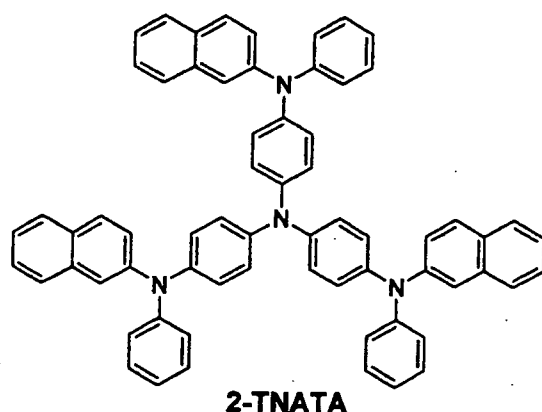
2193	$\delta = 8.47-8.35(m, 10H), 7.83(m, 1H), 7.75(m, 1H), 7.62-7.58(m, 2H), 7.34(m, 2H), 6.75(m, 1H), 6.59-6.58(m, 2H), 1.72(s, 6H)$	638.68	638.24
2161	$\delta = 8.02(m, 2H), 7.54-7.53(m, 2H), 7.35-7.34(m, 3H), 7.20(m, 8H), 6.94(m, 1H), 6.81(m, 4H), 6.63(m, 10H)$	562.70	562.24
2207	$\delta = 8.21(m, 1H), 7.84(m, 1H), 7.74(m, 1H), 7.54-7.48(m, 3H), 7.34(m, 2H), 7.20(m, 8H), 6.81(m, 4H), 6.63(m, 10H)$	562.70	562.24
2300	$\delta = 8.89(m, 1H), 8.68(m, 1H), 8.32(m, 1H), 8.08(m, 1H), 7.71(m, 2H), 7.34-7.32(m, 3H), 7.20(m, 8H), 7.08(m, 1H), 6.81(m, 4H), 6.63(m, 10H)$	612.76	612.26
2347	$\delta = 8.93-8.89(m, 2H), 8.32(m, 1H), 8.13-8.08(m, 3H), 7.88-7.82(m, 3H), 7.34(m, 2H), 7.20(m, 8H), 7.02(m, 1H), 6.81(m, 4H), 6.63(m, 10H)$	662.82	662.27
2391	$\delta = 7.83(m, 1H), 7.75(m, 3H), 7.62-7.58(m, 2H), 7.35-7.34(m, 4H), 7.20-7.16(m, 12H), 6.81-6.75(m, 5H), 6.63-6.58(m, 11H)$	750.93	750.30
2437	$\delta = 7.83(m, 1H), 7.75(m, 1H), 7.62-7.58(m, 2H), 7.34-7.20(m, 20H), 6.81-6.75(m, 5H), 6.63-6.58(m, 11H)$	752.94	752.32
2483	$\delta = 7.69(m, 2H), 7.33-7.20(m, 14H), 6.87-6.77(m, 6H), 6.63-6.61(m, 7H), 6.31-6.23(m, 3H), 4.59(m, 1H), 3.66(m, 1H)$	638.80	628.27
2529	$\delta = 8.05(m, 1H), 7.81-7.77(m, 2H), 7.69-7.62(m, 3H), 7.34(m, 2H), 7.20(m, 8H), 6.81-6.75(m, 5H), 6.63-6.58(m, 11H), 1.72(s, 12H)$	744.96	744.35
2575	$\delta = 7.91-7.87(m, 3H), 7.74(m, 1H), 7.59(m, 1H), 7.39-7.34(m, 6H), 7.20(m, 8H), 6.81(m, 4H), 6.63(m, 11H)$	686.84	686.27
2621	$\delta = 9.13(m, 1H), 8.93(m, 2H), 8.12(m, 2H), 7.88-7.82(m, 4H), 7.34(m, 2H), 7.20(m, 8H), 6.91(m, 1H), 6.81(m, 4H), 6.63(m, 10H)$	662.82	662.27

[實施例 1] 使用本發明之化合物製造 OLED

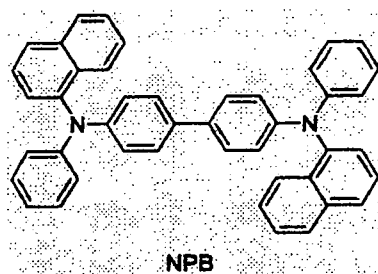
使用根據本發明之電致發光化合物製造 OLED 裝置。

首先，使用超音波依序以三氯乙烯、丙酮、乙醇及蒸餾水清洗由 OLED 用之玻璃製備之透明電極 ITO 薄膜($15 \Omega/\square$)，並於使用前儲存於異丙醇中。

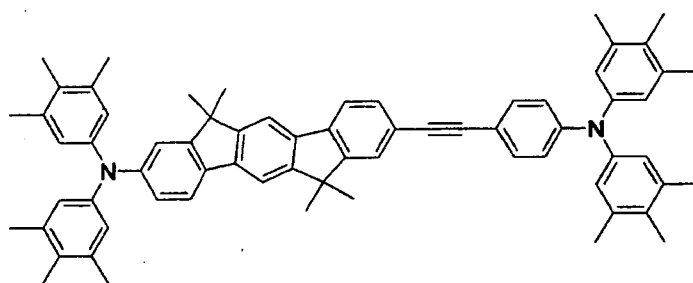
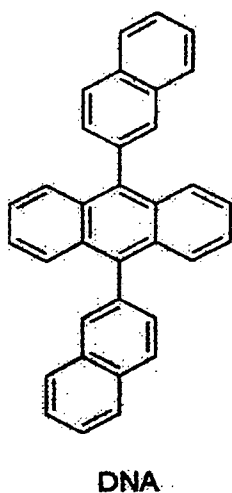
然後，將 ITO 基板裝配於真空氣相沉積裝置之基板夾中，並將 4, 4', 4'' - 參(N, N-(2-萘基)-苯基胺基)三苯胺 (2-TNATA)(其結構如下所示)置於真空氣相沉積裝置之小室中，接著於腔室中換氣以達到 10^{-6} torr 的真空。對小室施加電流以揮發 2-TNATA，從而在 ITO 基板上氣相沉積厚度為 60nm 之電洞注入層。



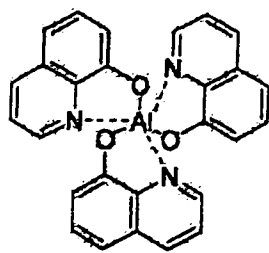
接著，將 N, N' - 雙(α -萘基)-N, N' - 二苯基-4, 4' - 二胺(NPB)(其結構如下所示)充填入真空氣相沉積裝置之另一小室中，且對小室施加電流以揮發 NPB，從而在電洞注入層上氣相沉積厚度為 20nm 之電洞傳輸層。



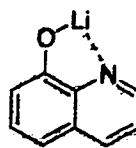
形成該電洞注入層及電洞傳輸層後，以下述方法氣相沉積電致發光層。將二萘基蔥(DNA)(其結構如下所示)作為電致發光材料填充入真空氣相沉積裝置之一小室中，並將根據本發明之化合物(如化合物(2545))填充入真空氣相沉積裝置之另一小室中。以 100:1 的氣相沉積速率於電洞傳輸層上氣相沉積厚度為 30 nm 之電致發光層。



接著，氣相沉積參(8-羥基喹啉)鋁(III)(Alq)(其結構如下所示)作為厚度為 20 nm 之電子傳輸層，且氣相沉積 8-羥基喹啉鋰(Liq)(其結構如下所示)作為厚度為 1 nm 至 2 nm 之電子注入層。而後，再使用另一真空氣相沉積裝置來氣相沉積厚度為 150 nm 之鋁陰極以製造 OLED。



Alq

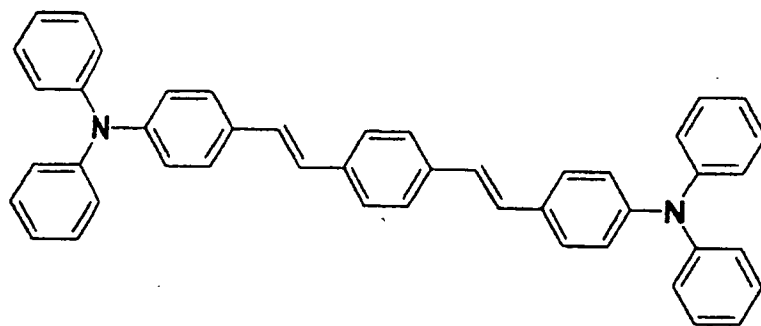


Liq

上述於 OLED 之製造中用來作為電致發光材料之各材料皆於使用前在 10^{-6} torr 壓力下經真空昇華而純化者。

[比較例 1] 使用習知電致發光材料製造 OLED

根據述於實施例 1 中之相同程序形成電洞注入層和電洞傳輸層後，將二萘基蔥(DNA)作為藍色電致發光材料填充入該真空氣相沉積裝置之一小室中，並將化合物(A)(其結構如下所示)作為另一藍色電致發光材料填充入另一小室中。之後，以 100:1 的氣相沉積速率於電洞傳輸層上氣相沉積具有厚度為 30 nm 之電致發光層。



化合物 A

隨後，根據實施例 1 之相同程序氣相沉積電子傳輸層及電子注入層，且使用另一真空氣相沉積裝置氣相沉積厚度為 150 nm 之 Al 陰極於其上，以製造 OLED。

[實施例 2] 所製備之 OLED 的電致發光性能

於 1,000 燭光/平方公尺(cd/m^2)測試包含根據本發明之有機 EL 化合物(實施例 1)或包含習知 EL 化合物(比較例 1)的 OLED 之發光效率，且結果示於表 3。

表 3

編號	EL 材料 1	EL 材料 2	發光效率 燭光/安培(cd/A)	顏色	發光效率/Y
1	DNA	化合物 2	6.2	藍色	47.7
2	DNA	化合物 12	5.9	藍色	45.4
3	DNA	化合物 34	5.1	藍色	42.5
4	DNA	化合物 347	6.2	藍色	47.7
5	DNA	化合物 713	6.7	藍色	51.5
6	DNA	化合物 817	7.2	藍色	51.4
7	DNA	化合物 1084	5.7	藍色	43.8
8	DNA	化合物 1115	6.5	藍色	50.0
9	DNA	化合物 1186	6.6	藍色	50.7
10	DNA	化合物 1427	5.9	藍色	49.2
11	DNA	化合物 1684	7.1	藍色	50.7
12	DNA	化合物 2189	7.0	藍色	53.8
13	DNA	化合物 2227	6.8	藍色	52.3
14	DNA	化合物 2301	7.0	藍色	53.8
15	DNA	化合物 2395	5.8	藍色	44.6
16	DNA	化合物 2450	6.2	藍色	47.7
17	DNA	化合物 2545	7.7	藍色	54.2
18	DNA	化合物 2585	7.1	藍色	53.6
19	DNA	化合物 2628	6.7	藍色	47.8
20	DNA	化合物 2677	6.3	藍色	51.0
21	DNA	化合物 2694	6.2	藍色	47.3
22	DNA	化合物 2713	7.2	藍色	49.2
比較例 1	DNA	化合物 A	7.3	碧綠色	35.8

由表 3 可見，發現與包含 DNA：化合物(A)(作為習知 EL 材料)(比較例 1)之 OLED 相比，使用根據本發明之有機 EL 化合物之 OLED 呈現較高的“發光效率/Y”值(其顯示相

近於量子效率的趨勢)。

因此，發現作為骨架的乙炔或根據本發明之有機電致發光化合物提供高量子效率之材料，並且該等化合物比習知 EL 化合物能實現更高的效率及更好的色純度。特別地，與習知 EL 材料相比，化合物(2545)呈現至少 60%的增進之“發光效率/Y”值。

預見包含三鍵之分子結構(而不是包含簡單的芳香共軛之結構)提供增進分子結構中的個別芳香環軌道之間的重疊效果，從而造成改善之性能。

如上所示，根據本發明之有機電致發光化合物可用作具高效率之藍色電致發光材料，並且與習知的全色 OLED 相比，根據本發明之有機電致發光化合物係提供運用於 OLED 中，在發光性、電力消耗及裝置壽命方面的優點。

【圖式簡單說明】

第 1 圖係有機發光二極體(OLED)之橫截面圖。

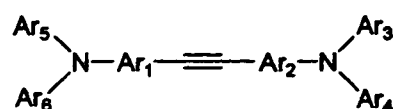
【主要元件符號說明】

- | | | | |
|---|-------|---|-------|
| 1 | 玻璃 | 2 | 透明電極 |
| 3 | 電洞注入層 | 4 | 電洞傳輸層 |
| 5 | 電致發光層 | 6 | 電子傳輸層 |
| 7 | 電子注入層 | 8 | 鋁陰極 |

七、申請專利範圍：

1. 一種如化學式(1)所示之有機電致發光化合物，

化學式(1)



其中，

Ar₁ 與 Ar₂ 係獨立地表示 (C6-C60) 伸芳基或 (C5-C60) 雜伸芳基，並且 Ar₁ 與 Ar₂ 之該伸芳基或雜伸芳基可進一步經一個或多個選自 氫、直鏈或分支鏈 (C1-C60) 烷基及 (C6-C60) 芳基之取代基取代；

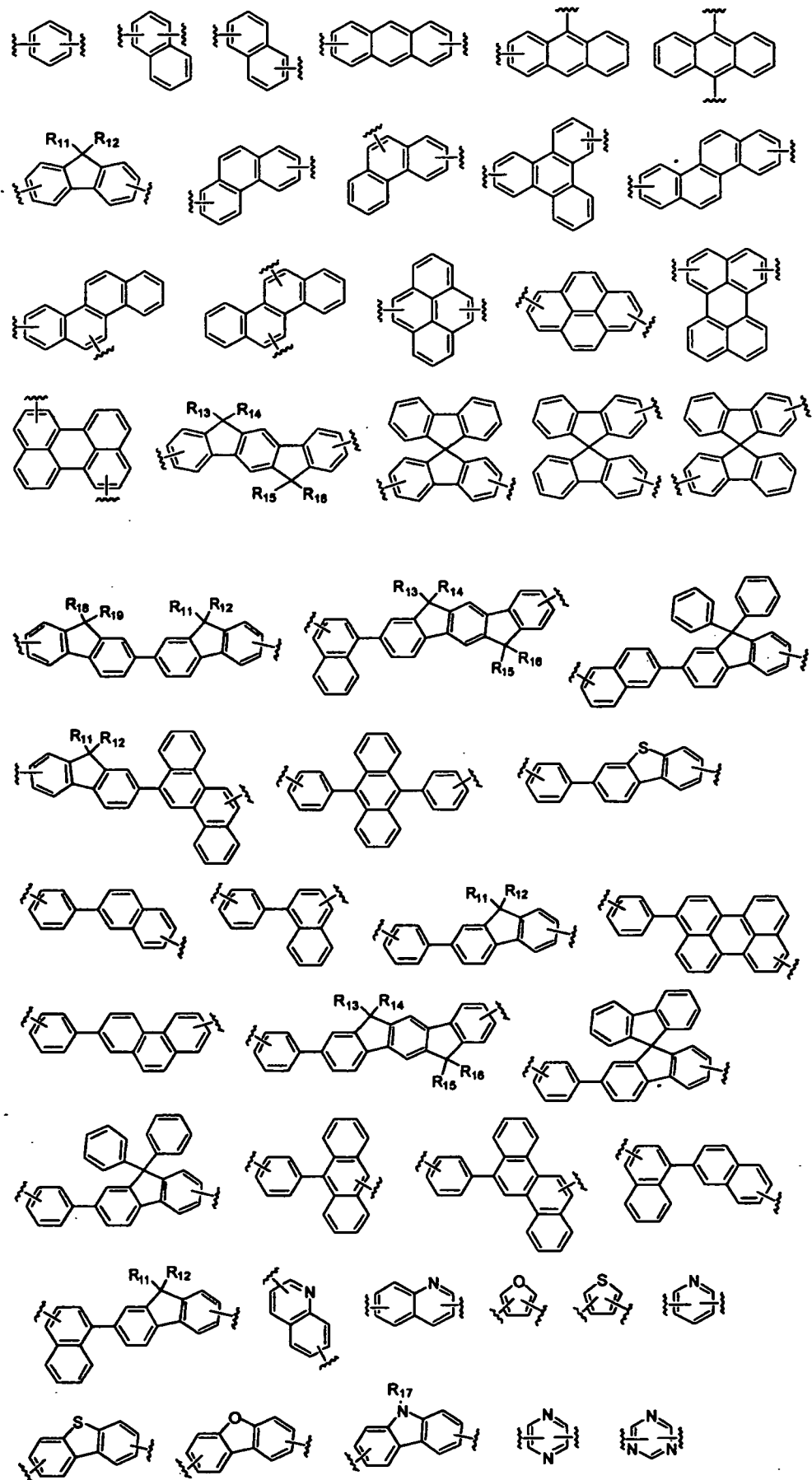
Ar₃ 至 Ar₆ 係獨立地表示直鏈或分支鏈 (C1-C60) 烷基、(C3-C60) 環烷基、含有一個或多個選自 N、O 及 S 之雜原子之 5 員或 6 員雜環烷基、(C6-C60) 芳基或 (C3-C60) 雜芳基；以及

Ar₃ 至 Ar₆ 之該芳基或雜芳基可進一步經一個或多個選自下列所組成群組之取代基取代：氫、含有或不含有直鏈或分支鏈 (C1-C60) 烷基或 (C6-C60) 芳基取代基之 (C6-C60) 芳基、含有或不含有鹵素取代基之直鏈或分支鏈 (C1-C60) 烷基、(C1-C30) 烷氧基、(C3-C60) 環烷基、鹵素、氰基、三 (C1-C30) 烷基矽烷基、二 (C1-C30) 烷基 (C6-C30) 芳基矽烷基及三 (C6-C30) 芳基矽烷基；

限制條件為 Ar₁ 及 Ar₂ 不同時為伸苯基。

2. 如申請專利範圍第 1 項之有機電致發光化合物，其中

Ar₁ 與 Ar₂ 係獨立地選自下列結構：

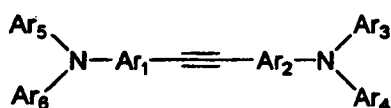


其中， R_{11} 至 R_{19} 係獨立地表示氫、直鏈或分支鏈

(C1-C60)烷基或(C6-C60)芳基，且芳基可進一步經直鏈或分支鏈(C1-C60)烷基取代。

3. 一種有機電致發光裝置，其係包括第一電極、第二電極、以及至少一個插置於該第一電極與該第二電極間之有機層，其中該有機層包括一種或多種如化學式(1)所示之有機電致發光化合物：

化學式(1)



其中，

Ar₁ 與 Ar₂ 獨立地表示(C6-C60)伸芳基或(C5-C60)雜伸芳基，並且 Ar₁ 與 Ar₂ 之伸芳基或雜伸芳基可進一步經一個或多個選自氘、直鏈或分支鏈(C1-C60)烷基及(C6-C60)芳基之取代基取代；

Ar₃ 至 Ar₆ 獨立地表示直鏈或分支鏈(C1-C60)烷基、(C3-C60)環烷基、含有一個或多個選自 N、O 及 S 之雜原子之 5 員或 6 員雜環烷基、(C6-C60)芳基或(C3-C60)雜芳基；以及

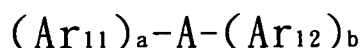
Ar₃ 至 Ar₆ 之該芳基或雜芳基可進一步經一個或多個選自下列所組成群組之取代基取代：氘、含有或不含有直鏈或分支鏈(C1-C60)烷基或(C6-C60)芳基取代基之(C6-C60)芳基、含有或不含有鹵素取代基之直鏈或分支鏈(C1-C60)烷基、(C1-C30)烷氧基、(C3-C60)環烷基、鹵素、氰基、三(C1-C30)烷基矽烷基、二(C1-C30)

烷基(C6-C30)芳基矽烷基及三(C6-C30)芳基矽烷基，

限制條件為 Ar_1 及 Ar_2 不同時為伸苯基；

以及一種或多種選自化學式(2)或化學式(3)所示之化合物之主體材料：

化學式(2)



化學式(3)



其中，

Ar_{11} 與 Ar_{12} 係獨立地選自氫、(C1-C60)烷基、(C1-C60)烷氧基、鹵素、(C4-C60)雜芳基、(C5-C60)環烷基及(C6-C60)芳基；並且 Ar_{11} 與 Ar_{12} 之環烷基、芳基或雜芳基可進一步經一個或多個選自下列所組成群組之取代基取代：含有或不含有一個或多個選自氫、含有或不含有鹵素取代基之(C1-C60)烷基、(C1-C60)烷氧基、(C3-C60)環烷基、鹵素、氰基、三(C1-C60)烷基矽烷基、二(C1-C60)烷基(C6-C60)芳基矽烷基及三(C6-C60)芳基矽烷基之取代基之(C6-C60)芳基或(C4-C60)雜芳基；含有或不含有鹵素取代基之(C1-C60)烷基；(C1-C60)烷氧基；(C3-C60)環烷基；鹵素；氰基；三(C1-C60)烷基矽烷基；二(C1-C60)烷基(C6-C60)芳基矽烷基；及三(C6-C60)芳基矽烷基；

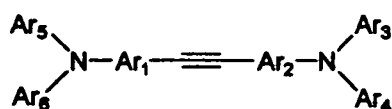
A 表示(C6-C60)伸芳基或(C4-C60)雜伸芳基；

a 與 b 係獨立地表示 0 至 4 之整數；以及

An 包括含有或不含有取代基之蔥骨架。

4. 如申請專利範圍第 3 項之有機電致發光裝置，其中該有機層包括一種或多種選自芳基胺化合物及苯乙烯基芳基胺化合物所組成群組之化合物。
5. 如申請專利範圍第 3 項之有機電致發光裝置，其中該有機層包括一種或多種選自下列所組成群組之金屬：元素周期表之第 1 族之有機金屬、第 2 族之有機金屬、第 4 周期與第 5 周期之過渡金屬、鑰系金屬及 d-過渡元素。
6. 如申請專利範圍第 3 項之有機電致發光裝置，係為包括具有波長為 500nm 至 560nm 的電致發光峰之化合物之有機顯示器。
7. 如申請專利範圍第 3 項之有機電致發光裝置，其中該有機層包括電致發光層及電荷產生層。
8. 如申請專利範圍第 3 項之有機電致發光裝置，其中於該電極對的一者或二者的內表面上設置還原性摻雜物與有機物質之混合區、或氧化性摻雜物與有機物質之混合區。
9. 一種有機太陽能電池，其係包括如化學式(1)所示之有機電致發光化合物：

化學式(1)



其中，

Ar₁ 與 Ar₂ 獨立地表示(C6-C60)伸芳基或(C5-C60)

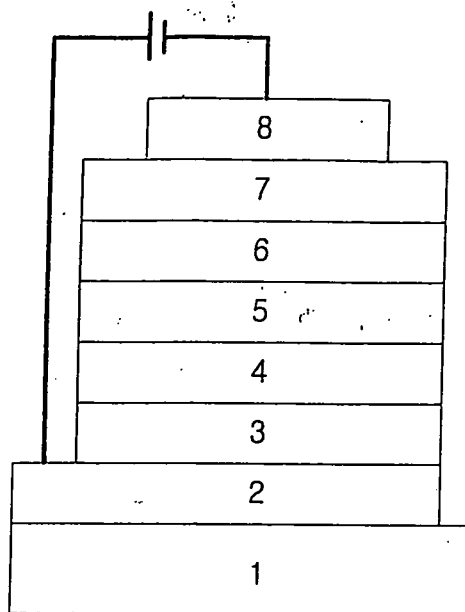
雜伸芳基，並且 Ar_1 與 Ar_2 之伸芳基或雜伸芳基可進一步經一個或多個選自氬、直鏈或分支鏈(C1-C60)烷基及(C6-C60)芳基之取代基取代；

Ar_3 至 Ar_6 獨立地表示直鏈或分支鏈(C1-C60)烷基、(C3-C60)環烷基、含有一個或多個選自 N、O 及 S 之雜原子之 5 員或 6 員雜環烷基、(C6-C60)芳基或(C3-C60)雜芳基；以及

Ar_3 至 Ar_6 之該芳基或雜芳基可進一步經一個或多個選自下列所組成群組之取代基取代：氬、含有或不含有直鏈或分支鏈(C1-C60)烷基或(C6-C60)芳基取代基之(C6-C60)芳基、含有或不含有鹵素取代基之直鏈或分支鏈(C1-C60)烷基、(C1-C30)烷氧基、(C3-C60)環烷基、鹵素、氰基、三(C1-C30)烷基矽烷基、二(C1-C30)烷基(C6-C30)芳基矽烷基及三(C6-C30)芳基矽烷基；

限制條件為 Ar_1 及 Ar_2 不同時為伸苯基。

八、圖式：



第 1 圖