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(71)申請人：葛來西雅帝史派有限公司 (南韓) GRACEL DISPLAY INC. (KR)
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申請實體審查：無 申請專利範圍項數：9 項 圖式數：1 共 190 頁

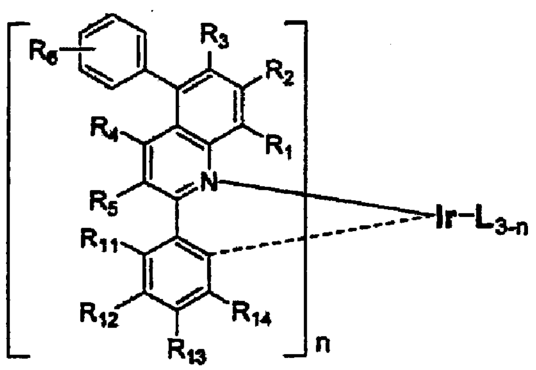
(54)名稱

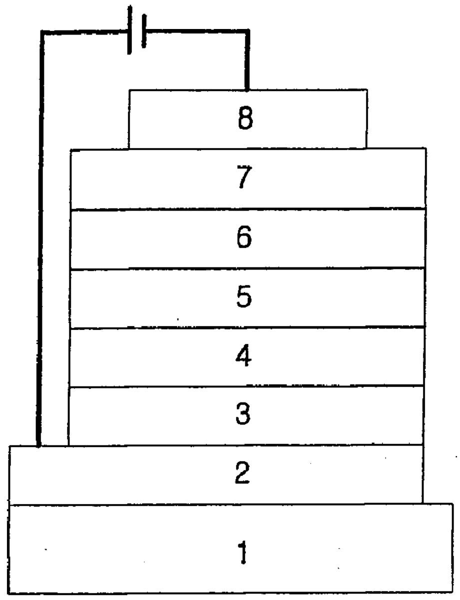
新穎有機電場發光化合物及使用該化合物之有機電場發光裝置

NOVEL ORGANIC ELECTROLUMINESCENT COMPOUNDS AND ORGANIC ELECTROLUMINESCENT DEVICE USING THE SAME

(57)摘要

本發明係關於顯示高發光效率之新穎有機電場發光化合物及化合包含該化合物之有機電場發光裝置。根據本發明之有機電場發光化合物係以化學式(1)表示化學式(1)





1：玻璃

2：透明電極

3：電洞注入層

4：電洞傳輸層

5：電場發光層

6：電子傳輸層

7：電子注入層

8：鋁陰極

(19)中華民國智慧財產局

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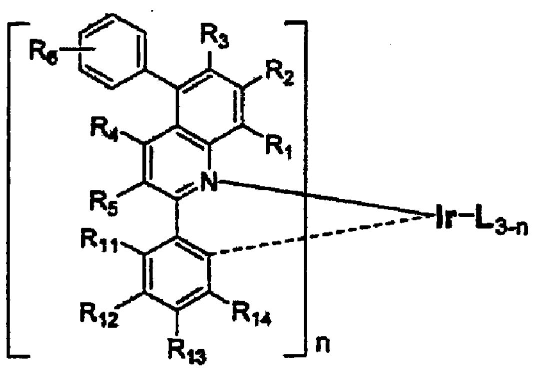


六、發明說明：

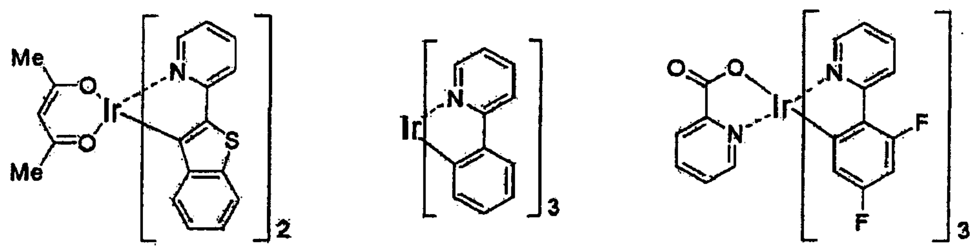
【發明所屬之技術領域】

本發明係關於顯示高發光效率(luminous efficiency)之新穎有機電場(electrolminescent)發光化合物及使用該化合物之有機電場發光裝置。

【先前技術】

決定有機發光二極體(Organic Light Emitting Diode, OLED)中的發光效率的最重要因素為電場發光材料的種類。雖然螢光材料到目前為止已廣泛地使用為電場發光材料，然而考慮於電場發光的機制，磷光材料的發展為理論上改善發光效率至高達4倍的最佳方法之一。

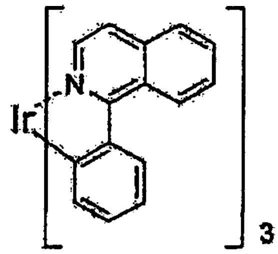
到目前為止，銥(III)複合物廣泛習知為磷光材料，包括分別為紅色、綠色與藍色之(acac)Ir(btp)$_2$、Ir(ppy)$_3$Firpic。特別是最近已在日本、歐洲和美國研究了許多磷光材料。



(acac)Ir(btp)$_2$　　Ir(ppy)$_3$　　Firpic

於習知的紅色磷光材料中，已記載數種材料具有良好的電場發光(EL)性質。然而，於其當中，只有非常少數的材料已達到商業化的層次。至於最佳的材料，可能被提到的是已知具有優良 EL 性質且顯示高發光效率之深紅色純

度的 1-苯基-異喹啉之銥複合物(參見 A. Tsuboyama 等人之 *J. Am, Chem. Soc.* 2003, 125(42), 12971-12979)。



1-苯基-異喹啉之銥複合物

再者，不具有明顯壽命時間問題的紅色材料，若其具有良好的色純度或發光效率，則具有易於商業化的傾向。因此，上述的銥複合物因其優良的色純度與發光效率，而為一種具有顯著的商業化可能性的材料。

然而，銥複合物仍僅被理解為一種可應用於小型顯示器的材料，而中型至大型尺寸的 OLED 面板則實際上需要較已知材料所具有的 EL 性質更高階的性質。

然而，雖然相較於傳統的材料而言，中至大尺寸的 OLED 屏實際上需要更高水平的 EL 特性，銥複合物依然被解釋為一種僅應用於小型顯示器的材料。

【發明內容】

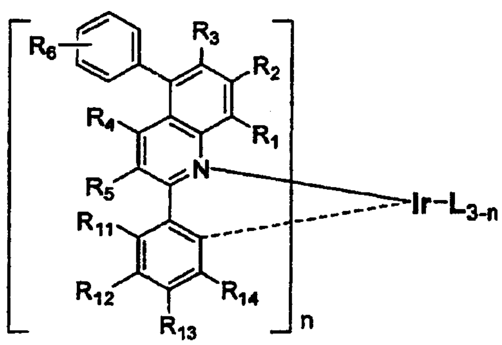
積極努力以克服上述習知技術的問題，本案發明者已針對發展出新穎有機電場發光化合物以實現具有優良發光效率與顯著地改善的使用壽命的有機 EL 裝置進行研究。最後，發明者發現當銥複合物作為電場發光裝置的摻雜物應用時，發光效率和壽命特性會改善，並且完成本發明，該銥複合物係藉由將苯基衍生物導入包括喹啉與苯衍生物的

主要配位子中之喹啉的5-位置所合成。因此，本發明之目的在於提供具有該骨架的新穎化合物，以產生相較於習知紅色磷光材料所具更為優良的性質。本發明之另一目的在於提供新穎有機電場化合物，其可應用至中型至大型尺寸OLED面板中。

本發明的又一目的為提供有機電場發光裝置及包括新穎有機電場發光化合物之有機太陽能電池。

因此，本發明係關於新穎有機電場發光化合物以及包括該化合物之有機電場發光裝置。具體來說，根據本發明之有機電場發光化合物以下列所表示的化學式(1)為其特徵：

化學式(1)

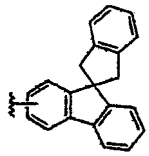


其中，L為有機配位子；

R_1至R_5獨立表示氫、(C_1-C_{60})烷基、(C_1-C_{60})烷氧基、(C_3-C_{60})環烷基、鹵素、三(C_1-C_{60})烷基矽烷基或三(C_6-C_{60})芳基矽烷基；

R_6表示氫、(C_1-C_{60})烷基、鹵素或(C_6-C_{60})芳基；

R_{11}至R_{14}獨立表示氫、(C_1-C_{60})烷基、鹵素、氰、三(C_1-C_{60})烷基矽烷基、三(C_6-C_{60})芳基矽烷基、(C_1-C_{60})烷氧基、三

(C_1-C_{60})烷基羰基、三(C_6-C_{60})芳基羰基、二(C_1-C_{60})烷基胺基、二(C_6-C_{60})芳基胺基、苯基、萘基、蒽基、茀基、螺二茀基(spirobifluorenyl)或 ，或 R_{11} 至 R_{14} 之各者可經由具有或是不具有稠合環之(C_3-C_{12})伸烷基或(C_3-C_{12})伸烯基鏈結至來自 R_{11} 至 R_{14} 之另一個相鄰基，而形成脂環、或是單環或多環之芳香環；

R_{11} 至 R_{14} 的烷基、苯基、萘基、蒽基、茀基，或是 R_{11} 至 R_{14} 經由具有或是不具有稠合環之(C_3-C_{12})伸烷基或(C_3-C_{12})伸烯基鏈結所產生之該脂環、或單環或多環之芳香環可進一步經由一個或多個選自下列各者之取代基取代：具有或是不具有鹵素取代基的(C_1-C_{60})烷基、(C_1-C_{60})烷氧基、鹵素、三(C_1-C_{60})烷基矽烷基、三(C_6-C_{60})芳基矽烷基、(C_1-C_{60})烷基羰基、(C_6-C_{60})芳基羰基、二(C_1-C_{60})烷基胺基、二(C_6-C_{60})芳基胺基以及(C_6-C_{60})芳基；以及

n 為 1 至 3 之整數。

【實施方式】

參閱圖式，第 1 圖圖示 OLED 的截面圖。該 OLED 包括玻璃 1、透明電極 2、電洞注入層 3、電洞傳輸層 4、電場發光層 5、電子傳輸層 6、電子注入層 7 以及 Al 陰極 8。

本文中敘述的術語“烷基”以及任何包括“烷基”部分的取代基包括直鏈與支鏈種類兩者。

本文中敘述的術語“芳基”表示經由除去一個氫原

子而自芳香族烯烴衍生的有機基。各環包括含有 4 至 7 個，較佳為 5 至 6 個環原子之單環或稠合環系統。實例包括，但不限於苯基、萘基、聯苯基、蒽基、四氫萘基、茚基、茀基、菲基、聯伸三苯基(triphenylenyl)、芘基、茈基、蒯基、稠四苯基以及丙二烯合茀基蒽(fluoranthenyl)。

本文中敘述的術語“雜芳基”表示含有 1 至 4 個選自 N、O 及 S 的雜原子，以及作為剩餘芳香族環主鏈的碳原子。雜芳基可為與一個或多個苯環稠合之 5-或 6-員單環雜芳基或多環雜芳基，且其可為部分飽合。雜芳基中之雜原子可經氧化或四元化(quaternize)以形成二價芳基，諸如，N-氧化物與四級銨鹽。實例包括，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、三哄基、四哄基、三唑基、四唑基、呋呫基、吡啶基、吡哄基、嘧啶基、嗒哄基；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(cinnolinyl)、喹唑啉基、喹噁啉基、咔唑基、啡啶基以及苯并二噁呃基(benzodioxolyl)；以及其對應的 N-氧化物(例如，吡啶基 N-氧化物，喹啉基 N-氧化物)及其四級銨鹽類。

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；以及茀基可為 1-茀基、2-茀基、

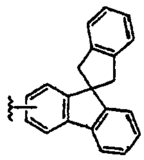
3-茀基、4-茀基或 9-茀基。

本文中所敘述之包括“(C_1-C_{60})烷基”部分的取代基可含有 1 至 60 個碳原子，1 至 20 個碳原子，或 1 至 10 個碳原子。包括“(C_6-C_{60})芳基”部分的取代基可含有 6 至 60 個碳原子，6 至 20 個碳原子，或 6 至 12 個碳原子。包括“(C_3-C_{60})雜芳基”部分的取代基可含有 3 至 60 個碳原子，4 至 20 個碳原子，或 4 至 12 個碳原子。包括“(C_3-C_{60})環烷基”部分的取代基可含有 3 至 60 個碳原子，3 至 20 個碳原子，或 3 至 7 個碳原子。包括“(C_2-C_{60})烯基或炔基”部分的取代基可含有 2 至 60 個碳原子，2 至 20 個碳原子，或 2 至 10 個碳原子。

經由具有或是不具有稠合環(C_3-C_{12})伸烷基或(C_3-C_{12})伸烯基鏈結來自化學式(1)中的 R_{11} 至 R_{14} 的兩個相鄰基所形成之該脂環、或是單環或多環之芳香環為苯、萘、蒽、茀、茚或菲。方括弧([])內的化合物作為銥的主要配位子，而且 L 作為輔助配位子。根據本發明之有機電場發光化合物亦包括主要配位子：輔助配位子的比率=2:1 (n=2)之複合物、以及主要配位子：輔助配位子的比率=1:2 (n=1)之比率之複合物，以及不具有輔助配位子(L) (n=3)之三嵌合(trice-chelated)複合物。

R_{11} 至 R_{14} 獨立表示氫、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、三氟甲基、氟、氰、三甲基矽烷基、三丙基矽烷基、三(第三丁基)矽烷基、

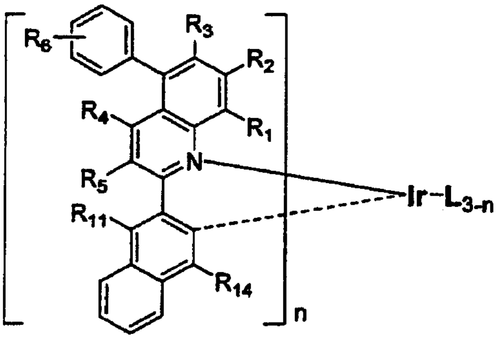
第三丁基二甲基矽烷基、三苯基矽烷基、甲氧基、乙氧基、丁氧基、甲基羰基、乙基羰基、第三丁基羰基、苯基羰基、二甲基胺基、二苯基胺基、苯基、萘基、蒽基、茀基或



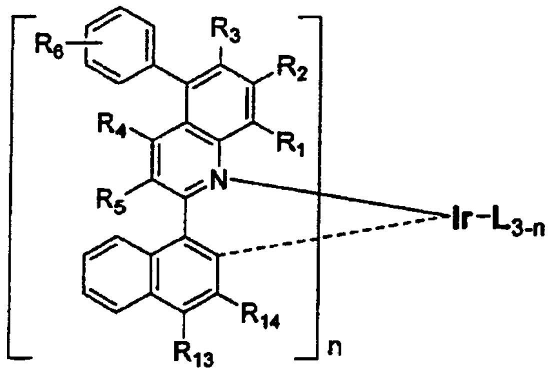
，而且茀基可進一步經由甲基、乙基、正丙基、異丙基、正丁基、異丁基、第三丁基、正戊基、異戊基、正己基、正庚基、正辛基、2-乙基己基、正壬基、苯基、萘基、蒽機、三甲基矽烷基、三丙基矽烷基、三(第三丁基)矽烷基、第三丁基二甲基矽烷基或三苯基矽烷基所取代。

根據本發明之有機電場發光化合物可藉由以化學式(2)至6之一者所表示之化合物來例示：

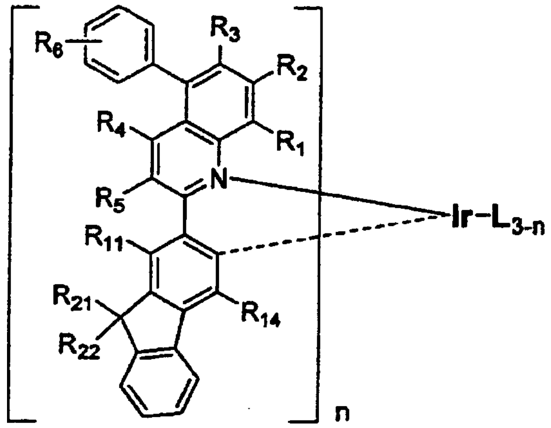
化學式 2



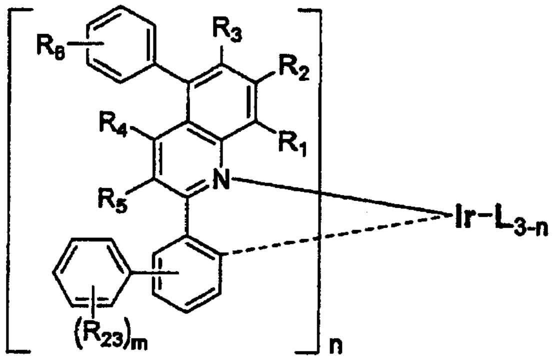
化學式 3



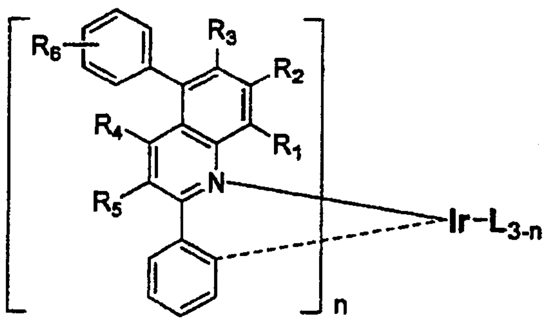
化學式 4



化學式 5



化學式 6



其中，L、R_1、R_2、R_3、R_4、R_5、R_6、R_{11}、R_{13}、R_{14}及 n 係如化學式(1)定義；

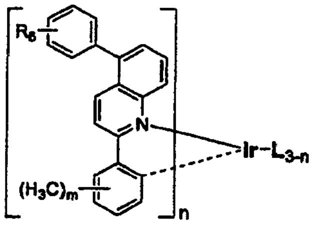
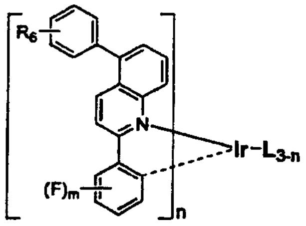
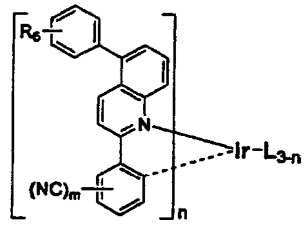
R_{21}與R_{22}獨立表示氫、(C_1-C_{60})烷基、(C_6-C_{60})芳基、或R_{21}與R_{22}可經由具有或是不具有稠合環之(C_3-C_{12})伸烷基或(C_3-C_{12})伸烯基互相鏈結而形成脂環、或是單環或多環之芳香環；

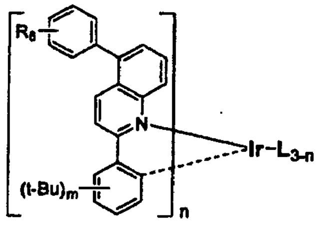
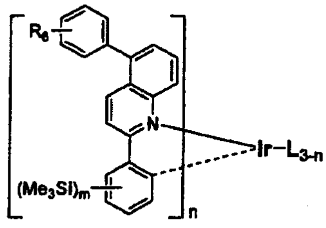
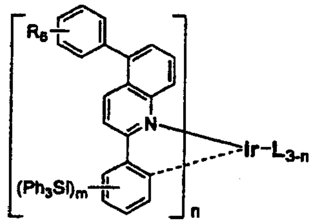
R_{23}表示(C_1-C_{60})烷基、鹵素、氰、三(C_1-C_{60})烷基矽烷基、三(C_6-C_{60})芳基矽烷基、(C_1-C_{60})烷氧基、(C_1-C_{60})烷基羰基、(C_6-C_{60})烷基羰基、苯基、二(C_1-C_{60})烷基胺基、二(C_6-C_{60})芳基胺基、萘基、9,9-二(C_1-C_{60})烷基茀基或 9,9-二(C_6-C_{60})芳基茀基；以及

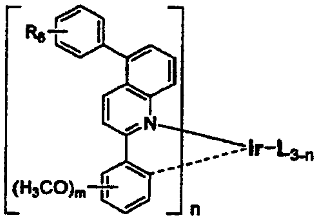
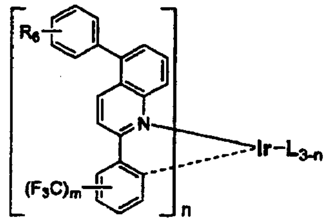
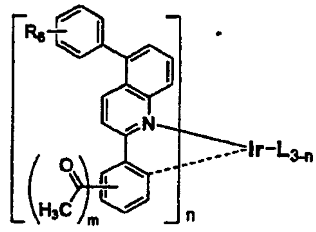
m 為 1 至 5 之整數。

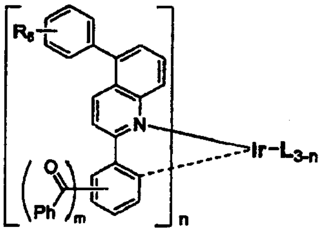
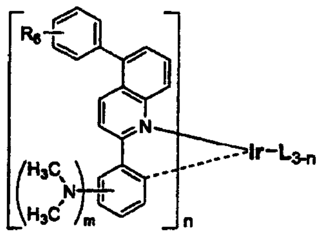
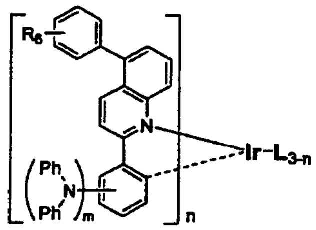
化學式(1)之R_1至R_5獨立表示氫、甲基、乙基、正丙基、異丙基、正丁基、異丁基、第三丁基、正戊基、異戊基、正己基、正庚基、正辛基、乙基已基、甲氧基、乙氧基、丁氧基、環丙基、環己基、環庚基、氟、三甲基矽烷基、三丙基矽烷基、三(第三丁基)矽烷基、第三丁基二甲基矽烷基或三苯基矽烷基；而且R_6表示氫、甲基、乙基、正丙基、異丙基、正丁基、異丁基、第三丁基、正戊基、異戊基、正己基、正庚基、正辛基、乙基已基、氟、苯基、萘基、蒽基、茀基或螺二茀基。

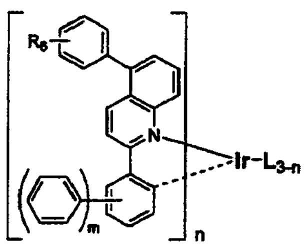
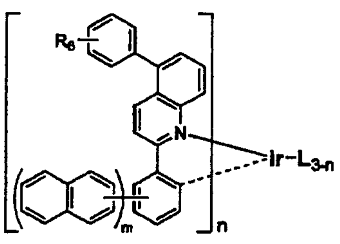
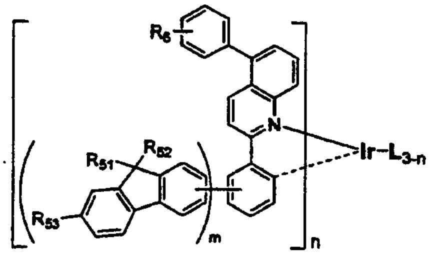
根據本發明之有機電場發光化合物可具體地，但不限於，由以下化合物所例示：

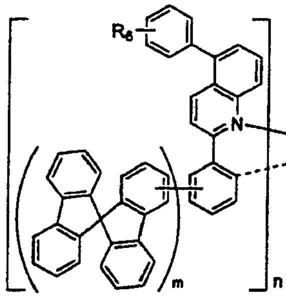




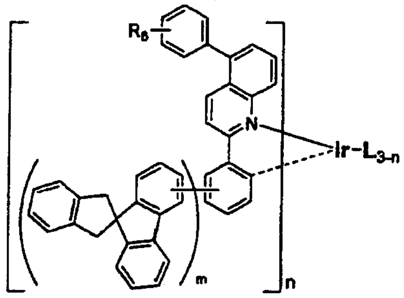




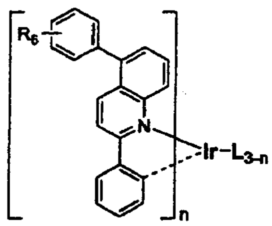




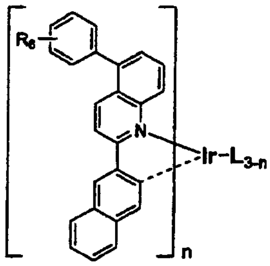




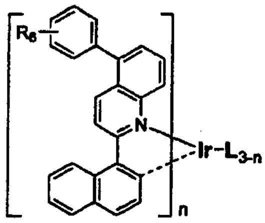




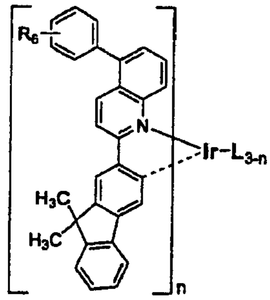


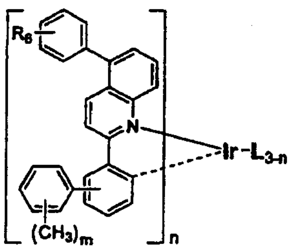


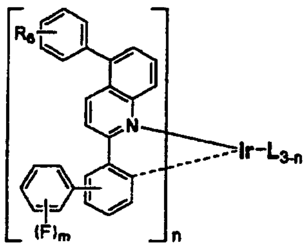


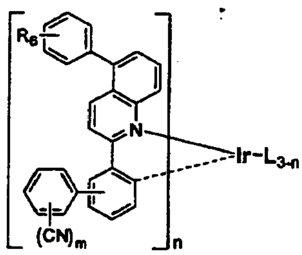


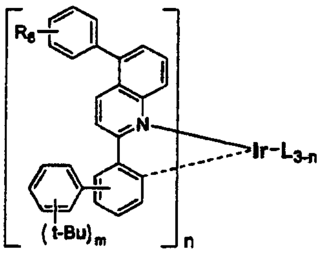


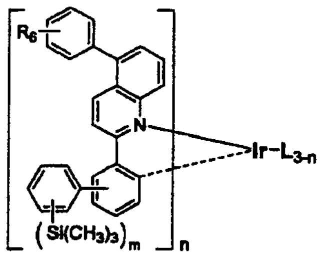


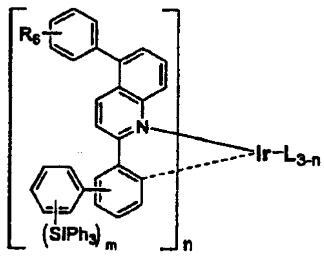


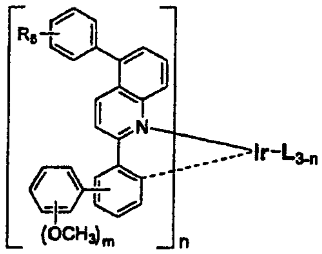
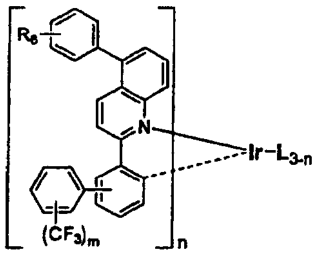
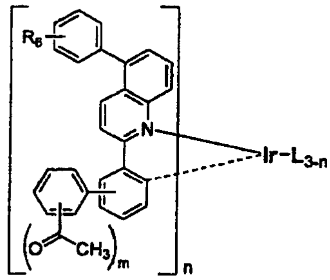


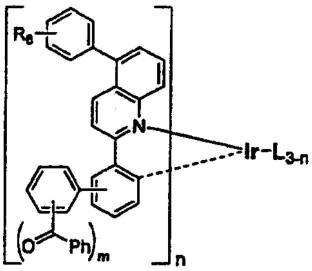
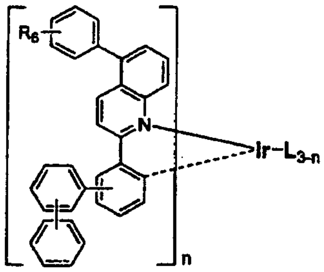
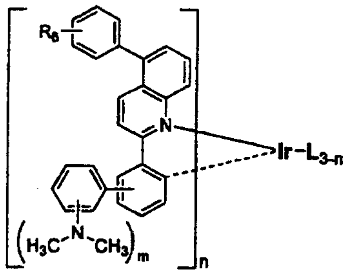


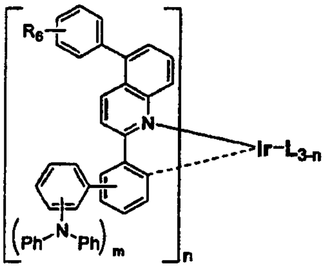
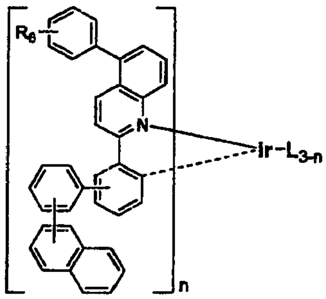
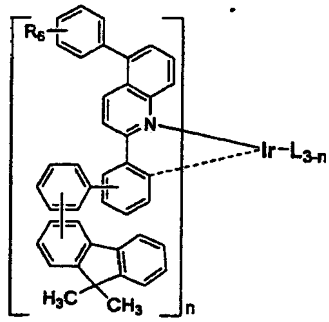






其中，L 表示有機配位子；

R_6 表示氫、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、乙基已基、氟、苯基或萘基；

R_{51} 與 R_{52} 獨立表示甲基、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、乙基已基、苯基或萘基，或 R_{51} 與 R_{52} 可經由具有或是不具有稠合環之(C_3-C_{12})伸烷基或(C_3-C_{12})伸烯基互相鏈結而形成脂環、或是單環或多環之芳香環；

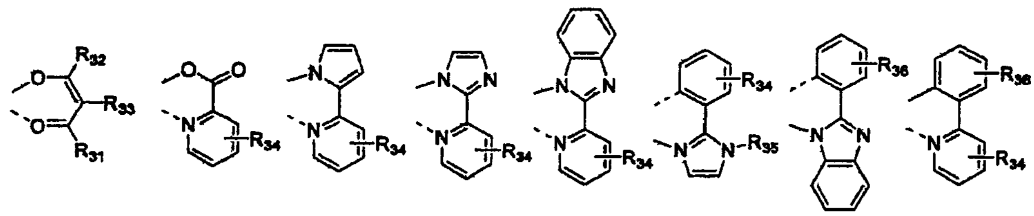
R_{53} 表示氫、甲基、乙基、正丙基、異丙基、正丁基、異丁基、第三丁基、正戊基、異戊基、正己基、正庚基、

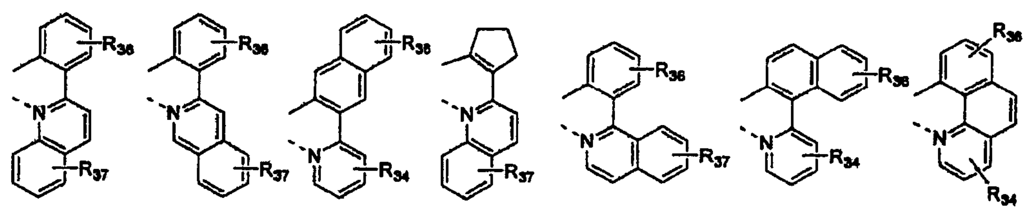
正辛基、2-乙基已基、三甲基矽烷基、三丙基矽烷基、三(第三丁基)矽烷基、第三丁基二甲基矽烷基、三苯基矽烷基、苯基或萘基；

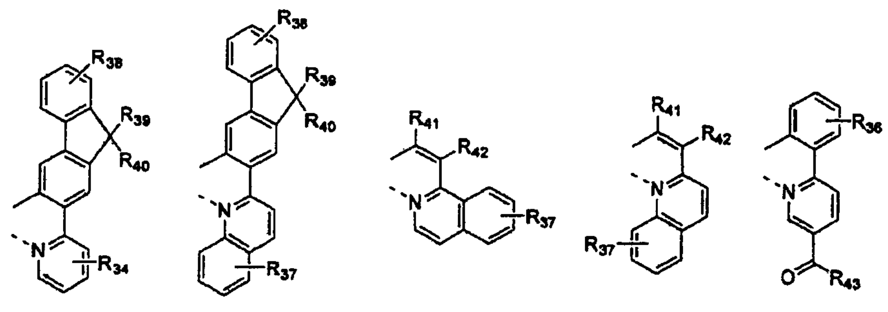
m為1至3之整數；以及

n為1至3之整數。

根據本發明之有機電場發光化合物之輔助配位子(L)包括下列結構：







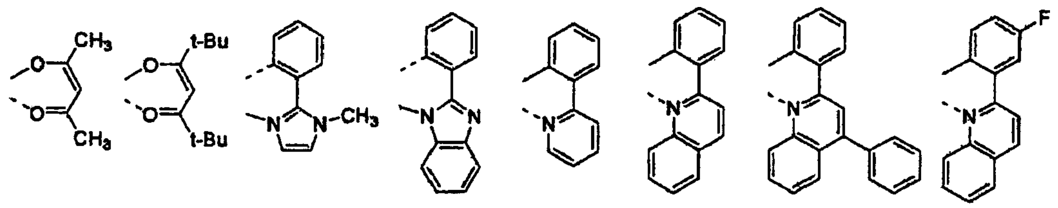
其中，R_{31}和 R_{32}獨立表示氫、具有或不具有鹵素取代基之(C_1-C_{60})烷基、具有或不具有(C_1-C_{60})烷基取代基之苯基或鹵素；

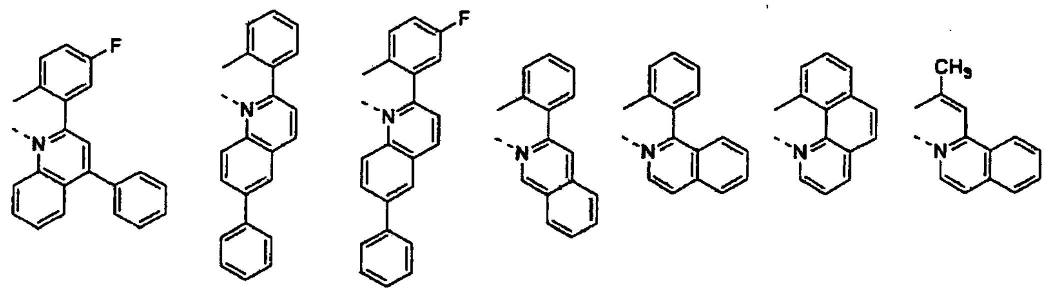
R_{33}至 R_{38}獨立表示氫、(C_1-C_{60})烷基、具有或不具有(C_1-C_{60})烷基取代基之苯基、三(C_1-C_{60})烷基矽烷基或鹵素；

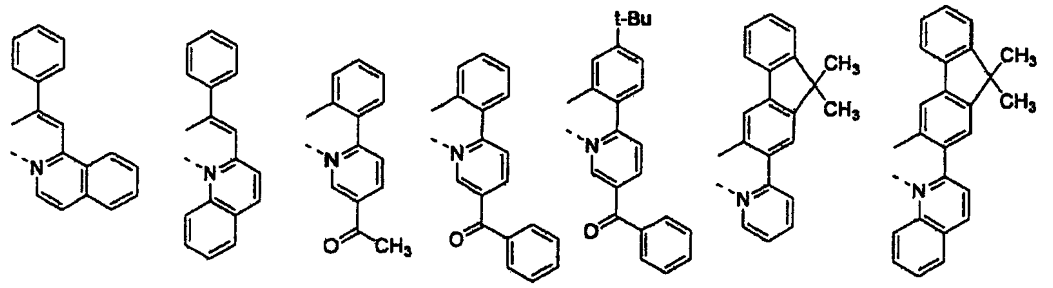
R_{39} 至 R_{42} 獨立表示氫、(C_1-C_{60})烷基、具有或不具有(C_1-C_{60})烷基取代基之苯基；以及

R_{43} 表示(C_1-C_{60})烷基、具有或不具有(C_1-C_{60})烷基取代基之苯基、或鹵素。

根據本發明之有機電場發光化合物的輔助配位子(L)可藉由但不限於以下列結構例示之：

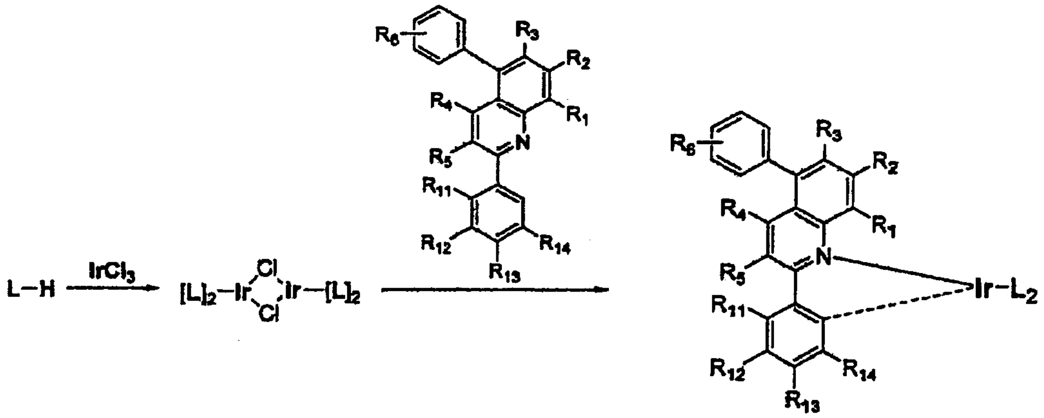




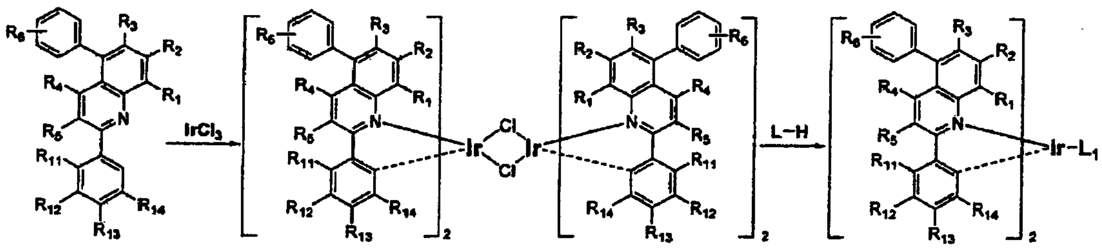


根據本發明之製備有機電場發光化合物的製程係藉由參考以下所示之反應圖描述：

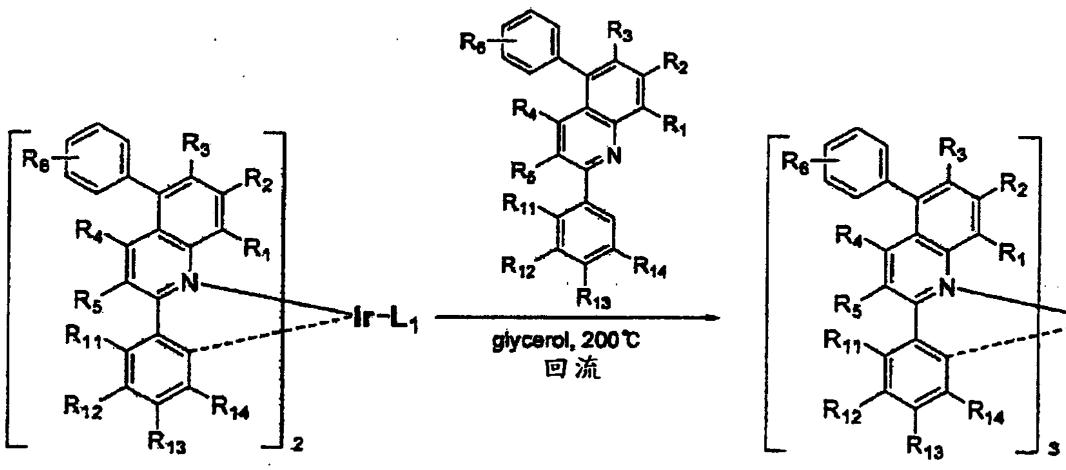
反應圖 1



反應圖 2



反應圖 3



其中，R_1、R_2、R_3、R_4、R_5、R_6、R_{11}、R_{13}、R_{14}及 L 係如化學式(1)般定義。

反應圖(1)提供具有 n=1 之化學式(1)之化合物，其中三氯化銥($IrCl_3$)與輔助配位子(L-H)以 1：2 至 3 之莫耳比

率於溶劑中混合，而且在單離二銥二聚物之前，將混合物於回流加熱。在反應階段中，較佳的溶劑為醇或醇/水之混合溶劑，諸如，2-乙氧基乙醇，及 2-乙氧基乙醇/水混合物。接著，將經單離之二銥二聚物與主要配位子於有機溶劑中加熱，以提供具有 1：2 的主要配位子：輔助配位子之比率的有機磷光銥化合物作為最終產物。該反應係與 $AgCF_3SO_3$、Na_2CO_3 或 NaOH 一起進行，其中，該 $AgCF_3SO_3$、Na_2CO_3 或 NaOH 係與有機溶劑(諸如，2-乙氧基乙醇及 2-甲氧基乙基乙醚)混合。

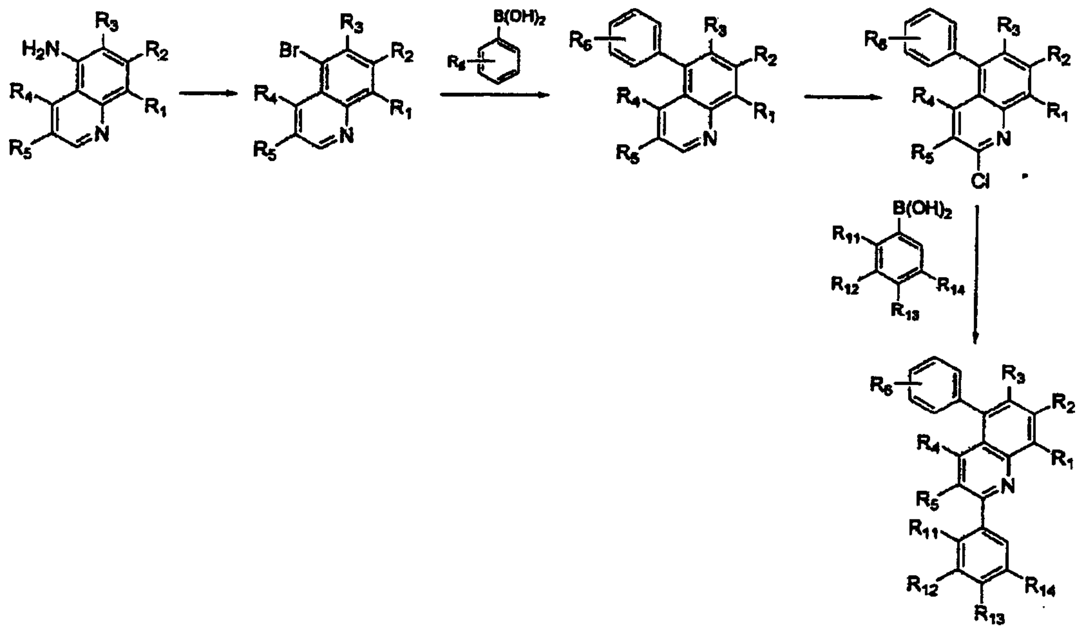
反應圖(2)提供具有 n=2 之化學式(1)之化合物，其中三氯化銥($IrCl_3$)與主要配位子化合物以 1：2 至 3 之莫耳比率於溶劑中混合，而且在單離二銥二聚物之前，將混合物於回流加熱。在反應階段中，較佳的溶劑為醇或醇/水之混合溶劑，諸如，2-乙氧基乙醇，及 2-乙氧基乙醇/水混合物。接著，將經單離之二銥二聚物與輔助配位子化合物(L-H)於有機溶劑中加熱，以提供具有 1:2 的主要配位子：輔助配位子之比率之有機磷光銥化合物作為最終產物。最終產物中之主要配位子化合物與輔助配位子(L)之莫耳比率係藉由取決於組成物之反應物的的適當莫耳比率而決定。該反應係與 $AgCF_3SO_3$、Na_2CO_3 或 NaOH 一起進行，其中，該 $AgCF_3SO_3$、Na_2CO_3 或 NaOH 係與有機溶劑(諸如，2-乙氧基乙醇、2-甲氧基乙基乙醚以及 1,2-二氯乙醇)混合。

反應圖(3)提供具有 n=3 之化學式(1)之化合物，其中根據反應圖(2)而製備之銥複合物與主要配位子以 1：2 至

3 之莫耳比率於甘油中混合，而且在單離二銥二聚物之前，將混合物於回流回流加熱以得到與三個主要配位子配位之有機磷光銥複合物。

基於習知製程，本發明中所採用之作為主要配位子的化合物可根據反應圖(4)而製備。

反應圖 4



其中，R_1至R_6係如化學式(1)般定義。

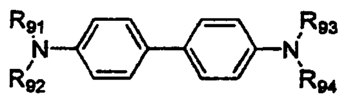
本發明亦提供有機太陽能電池，其包括一種或多種由化學式(1)所表示之有機電場發光化合物。

本發明亦提供一種有機電場發光裝置，其係由第一電極；第二電極；以及插置於該第一電極與第二電極之間之至少一層有機層所組成；其中，該有機層包括一種或多種由化學式(1)所表示之化合物。

根據本發明之有機電場發光裝置其特徵為有機層包括電場發光區域，該電場發光區域包括 0.01 至 10 重量%

之一種或多種化學式(1)所表示之有機電場發光化合物作為電場發光摻雜物，及一種和多種主體材料(host)。應用於根據本發明之有機電場發光裝置之主體材料並無特別限制，但可藉由 1,3,5-三咔唑基苯、聚乙烯基咔唑、間-雙咔唑基苯基(m-biscarbazolylphenyl)、4,4’,4”-三(N-咔唑基)三苯胺、1,3,5-三(2-咔唑基苯基)苯、1,3,5-參(2-咔唑基-5-甲氧基苯基)苯、雙(4-咔唑基苯基)矽烷或化學式(6)至(9)之一者所表示之化合物：

化學式(6)

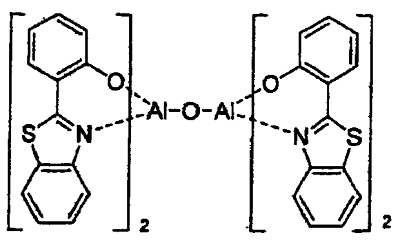


在化學式(6)中，R_{91} 至 R_{94} 獨立表示氫、鹵素、(C_1-C_{60})烷基、(C_6-C_{60})芳基、(C_4-C_{60})雜芳基、含有一個或多個選自 N、O 及 S 之雜原子之 5-或 6-員雜環烷基、(C_3-C_{60})環烷基、三(C_1-C_{60})烷基矽烷基、二(C_1-C_{60})烷基(C_6-C_{60})芳基矽烷基、三(C_6-C_{60})芳基矽烷基、金剛烷基、(C_7-C_{60})雙環烷基、(C_2-C_{60})烯基、(C_2-C_{60})炔基、氰、(C_1-C_{60})烷基胺基、(C_6-C_{60})芳基胺基、(C_6-C_{60})芳基(C_1-C_{60})烷基、(C_1-C_{60})烷氧基、(C_1-C_{60})烷硫基、(C_6-C_{60})芳氧基、(C_6-C_{60})芳硫基、(C_1-C_{60})烷氧基羰基、(C_1-C_{60})烷基羰基、(C_6-C_{60})芳基羰基、羧基、硝基或羥基，或 R_{91} 至 R_{94} 之各者可經由具有或是不具有稠合環之(C_3-C_{60})伸烷基或(C_3-C_{60})伸烯基鏈結至一相鄰取代基而形成脂環、或是單環或多環之芳香環；

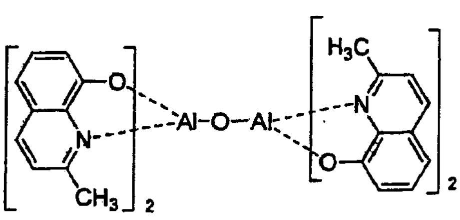
R_{91} 至 R_{94} 之烷基、烯基、炔基、環烷基、雜環烷基、

芳基、雜芳基、芳基矽烷基、烷基矽烷基、烷基胺基、或芳基胺基、或 R_{91} 至 R_{94} 經由具有或是不具有稠合環之(C_3-C_{60})伸烷基或(C_3-C_{60})伸烯基鏈結至一相鄰取代基所形成的該脂環、或單環或多環之芳香環可進一步經由一個或多個選自下列之取代基取代：鹵素、(C_1-C_{60})烷基、(C_6-C_{60})芳基、(C_4-C_{60})雜芳基、含有一個或多個選自 N、O 以及 S 之雜原子之 5-或 6-員雜環烷基、(C_3-C_{60})環烷基、三(C_1-C_{60})烷基矽烷基、二(C_1-C_{60})烷基(C_6-C_{60})芳基矽烷基、三(C_6-C_{60})芳基矽烷基、金剛烷基、(C_7-C_{60})雙環烷基、(C_2-C_{60})烯基、(C_2-C_{60})炔基、氰、(C_1-C_{60})烷基胺基、(C_6-C_{60})芳基胺基、(C_6-C_{60})芳基(C_1-C_{60})烷基、(C_1-C_{60})烷氧基、(C_1-C_{60})烷硫基、(C_6-C_{60})芳氧基、(C_6-C_{60})芳硫基、(C_1-C_{60})烷氧基羰基、(C_1-C_{60})烷基羰基、(C_6-C_{60})芳基羰基、羧基、硝基以及羥基。

化學式(7)



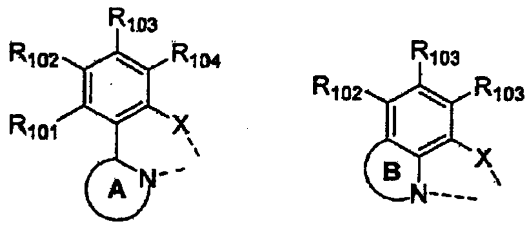
化學式(8)



化學式(9)

$L^1L^2M^1(Q)_y$

在化學式(9)中，配位子 L^1 以及 L^2 獨立選自以下結構：



；

M^1 為二價或三價金屬；

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

Q 表示(C_6-C_{20})芳氧基或三(C_6-C_{20})芳基矽烷基，而且 Q 之芳氧基與三芳基矽烷基可進一步經由(C_1-C_{60})烷基或(C_6-C_{60})芳基取代；

X 代表 O、S 或 Se；

環 A 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；

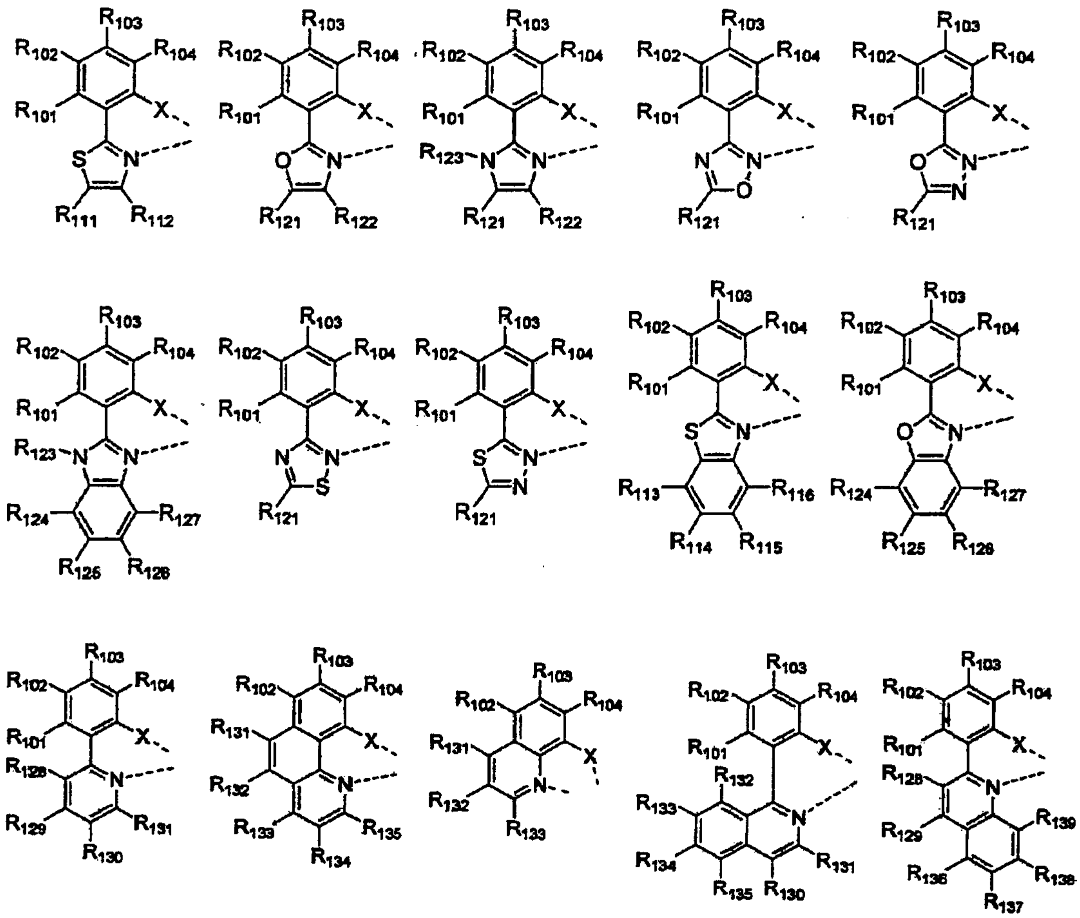
環 B 表示吡啶或喹啉，而且環 B 可進一步經由(C_1-C_{60})烷基，或具有或不具有 (C_1-C_{60})烷基取代基之苯基或萘基；

R_{101} 至 R_{104} 獨立表示氫、鹵素、(C_1-C_{60})烷基、(C_6-C_{60})芳基、(C_4-C_{60})雜芳基、含有一個或多個選自 N、O 及 S 之雜原子之 5-或 6-員雜環烷基、(C_3-C_{60})環烷基、三(C_1-C_{60})烷基矽烷基、二(C_1-C_{60})烷基(C_6-C_{60})芳基矽烷基、三(C_6-C_{60})芳基矽烷基、金剛烷基、(C_7-C_{60})雙環烷基、(C_2-C_{60})烯基、(C_2-C_{60})炔基、氰、(C_1-C_{60})烷基胺基、(C_6-C_{60})芳基胺基、

(C_6-C_{60})芳基(C_1-C_{60})烷基、(C_1-C_{60})烷氧基、(C_1-C_{60})烷硫基、(C_6-C_{60})芳氧基、(C_6-C_{60})芳硫基、(C_1-C_{60})烷氧基羰基、(C_1-C_{60})烷基羰基、(C_6-C_{60})芳基羰基、羧基、硝基或羥基，或R_{101}至R_{104}之各者可經由具有或是不具有稠合環之(C_3-C_{60})伸烷基或(C_3-C_{60})伸烯基鏈結至一相鄰取代基而形成脂環、或是單環或多環之芳香環；

環A以及R_{101}至R_{104}之烷基、烯基、炔基、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、或芳基胺基、或R_{101}至R_{104}經由具有或是不具有稠合環之(C_3-C_{60})伸烷基或(C_3-C_{60})伸烯基鏈結至一相鄰取代基所形成的該脂環、或單環或多環之芳香環可進一步經由一個或多個選自下列各者之取代基取代：鹵素、(C_1-C_{60})烷基、(C_6-C_{60})芳基、(C_4-C_{60})雜芳基、含有一個或多個選自N、O以及S之雜原子之5-或6-員環雜芳烷基、(C_3-C_{60})環烷基、三(C_1-C_{60})烷基矽烷基、二(C_1-C_{60})烷基(C_6-C_{60})芳基矽烷基、三(C_6-C_{60})芳基矽烷基、金剛烷基、(C_7-C_{60})雙環烷基、(C_2-C_{60})烯基、(C_2-C_{60})炔基、氰、(C_1-C_{60})烷基胺基、(C_6-C_{60})芳基胺基、(C_6-C_{60})芳基(C_1-C_{60})烷基、(C_1-C_{60})烷氧基、(C_1-C_{60})烷硫基、(C_6-C_{60})芳硫基、(C_1-C_{60})烷氧基羰基、(C_1-C_{60})烷基羰基、(C_6-C_{60})芳基羰基、羧基、硝基以及羥基。

配位子、L^1以及L^2係獨立選自以下結構：



其中，X 表示 O、S 或 Se；

R_{101} 至 R_{104} 獨立表示氫、鹵素、(C_1-C_{60})烷基、(C_6-C_{60})芳基、(C_4-C_{60})雜芳基、含有一個或多個選自 N、O 及 S 之雜原子之 5-或 6-員雜環烷基、(C_3-C_{60})環烷基、三(C_1-C_{60})烷基矽烷基、二(C_1-C_{60})烷基(C_6-C_{60})芳基矽烷基、三(C_6-C_{60})芳基矽烷基、金剛烷基、(C_7-C_{60})雙環烷基、(C_2-C_{60})烯基、(C_2-C_{60})炔基、氰、(C_1-C_{60})烷基胺基、(C_6-C_{60})芳基胺基、(C_6-C_{60})芳基(C_1-C_{60})烷基、(C_1-C_{60})烷氧基、(C_1-C_{60})烷硫基、(C_6-C_{60})芳氧基、(C_6-C_{60})芳硫基、(C_1-C_{60})烷氧基羰基、(C_1-C_{60})烷基羰基、(C_6-C_{60})芳基羰基、羧基、硝基或羥基，或 R_{101} 至 R_{104} 之各者可經由具有或是不具有稠合環之(C_3-C_{60})

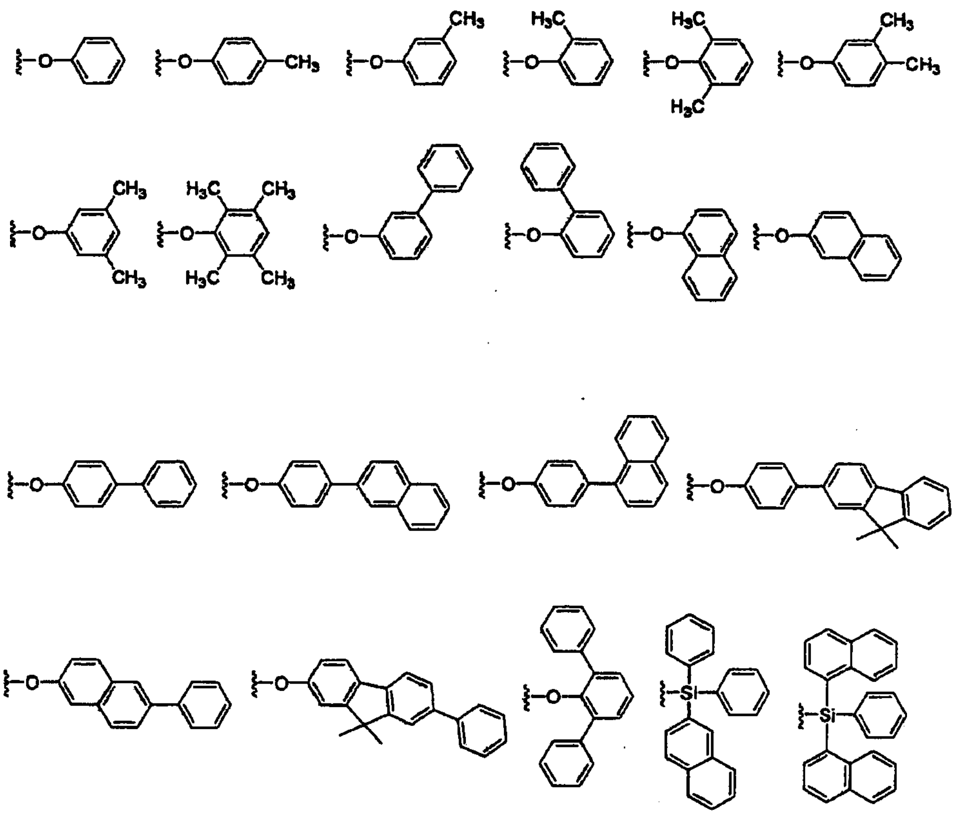
伸烷基或(C_3-C_{60})伸烯基鏈結至一相鄰取代基而形成脂環、或是單環或多環之芳香環；

R_{111}至R_{116}以及R_{121}至R_{139}獨立表示氫、鹵素、(C_1-C_{60})烷基、(C_6-C_{60})芳基、(C_4-C_{60})雜芳基、含有一個或多個選自N、O及S之雜原子之5-或6-員雜環烷基、(C_3-C_{60})環烷基、三(C_1-C_{60})烷基矽烷基、二(C_1-C_{60})烷基(C_6-C_{60})芳基矽烷基、三(C_6-C_{60})芳基矽烷基、金剛烷基、(C_7-C_{60})雙環烷基、(C_2-C_{60})烯基、(C_2-C_{60})炔基、氰、(C_1-C_{60})烷基胺基、(C_6-C_{60})芳基胺基、(C_6-C_{60})芳基(C_1-C_{60})烷基、(C_1-C_{60})烷氧基、(C_1-C_{60})烷硫基、(C_6-C_{60})芳氧基、(C_6-C_{60})芳硫基、(C_1-C_{60})烷氧基羰基、(C_1-C_{60})烷基羰基、(C_6-C_{60})芳基羰基、羧基、硝基或羥基，或R_{111}至R_{116}以及R_{121}至R_{139}之各者可經由具有或是不具有稠合環之(C_3-C_{60})伸烷基或(C_3-C_{60})伸烯基鏈結至一相鄰取代基而形成脂環、或是單環或多環之芳香環；

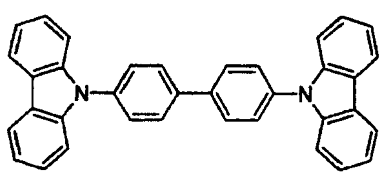
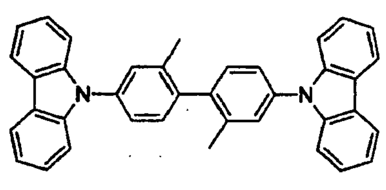
R_{101}至R_{104}、R_{111}至R_{116}、以及R_{121}至R_{139}之烷基、烯基、炔基、環烷基、雜環烷基、芳基、雜芳基、芳基矽烷基、烷基矽烷基、烷基胺基、或芳基胺基、或R_{101}至R_{104}、R_{111}至R_{116}、以及R_{121}至R_{139}經由具有或是不具有稠合環之(C_3-C_{60})伸烷基或(C_3-C_{60})伸烯基鏈結至一相鄰取代基所形成的該脂環、或單環或多環之芳香環可進一步經由一個或多個選自下列之取代基取代：鹵素、(C_1-C_{60})烷基、(C_6-C_{60})芳基、(C_4-C_{60})雜芳基、含有一個或多個選自N、O以及S之雜原子之5-或6-員雜環烷基、(C_3-C_{60})環烷基、三(C_1-C_{60})烷基矽烷基、二(C_1-C_{60})烷基(C_6-C_{60})芳基矽烷基、三(C_6-C_{60})芳

基矽烷基、金剛烷基、(C_7-C_{60})雙環烷基、(C_2-C_{60})烯基、(C_2-C_{60})炔基、氰、(C_1-C_{60})烷基胺基、(C_6-C_{60})芳基胺基、(C_6-C_{60})芳基(C_1-C_{60})烷基、(C_1-C_{60})烷氧基、(C_1-C_{60})烷硫基、(C_6-C_{60})芳氧基、(C_6-C_{60})芳硫基、(C_1-C_{60})烷氧基羰基、(C_1-C_{60})烷基羰基、(C_6-C_{60})芳基羰基、羰基及硝基。

在化學式(9)中，M_1為選自 Be、Zn、Mg、Cu 及 Ni 之二價金屬，或選自 Al、Ga、In 及 B 的三價金屬，而且 Q 係選自以下結構：



化學式(6)之化合物可具體地，但不限於，以下結構所例示。

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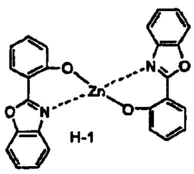
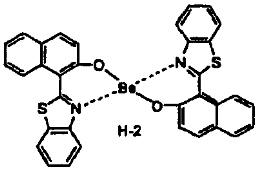
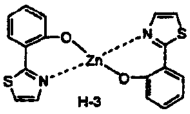
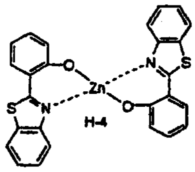
化學式(7)至(9)之一者所表示之化合物可具體地，但不限於，具有以下結構之化合物所例示。


H-1


H-2


H-3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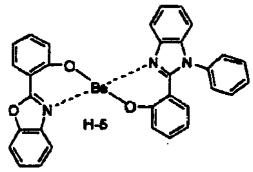
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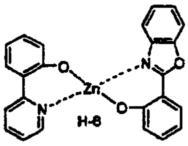
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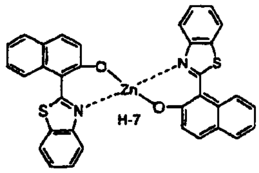
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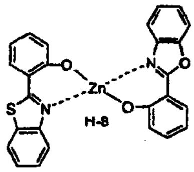
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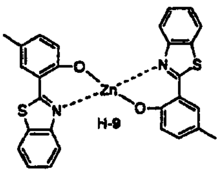
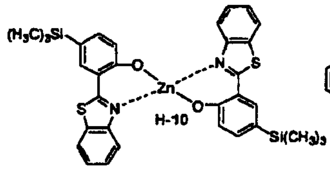
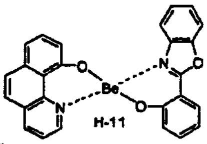

H-9


H-10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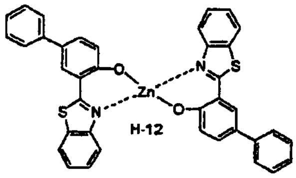
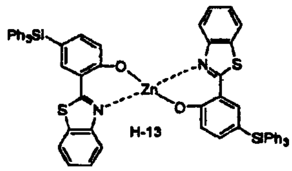
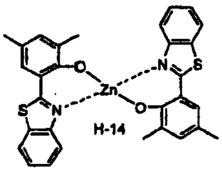
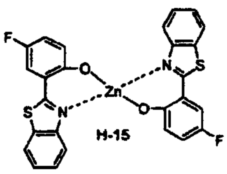
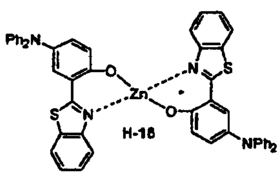
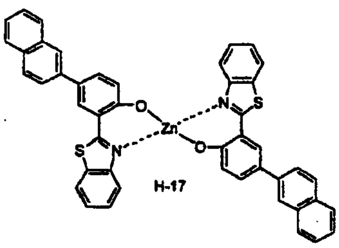

H-12

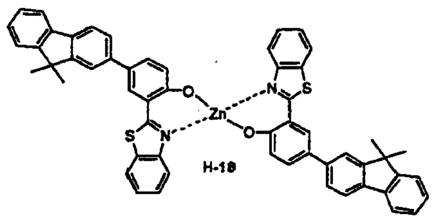

H-13

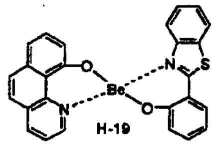

H-14


H-15


H-16


H-17


H-18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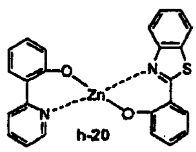
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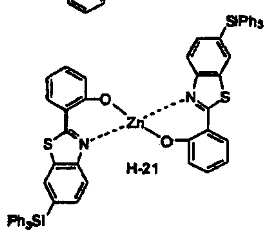
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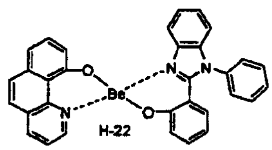
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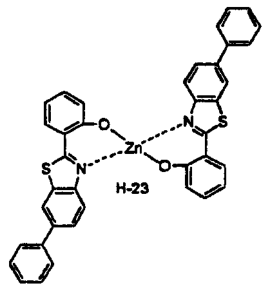
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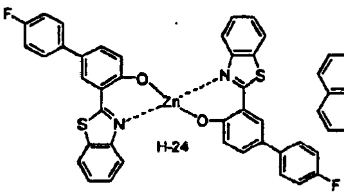
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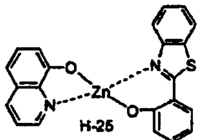
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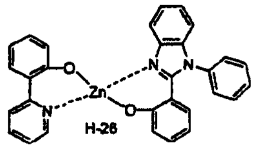
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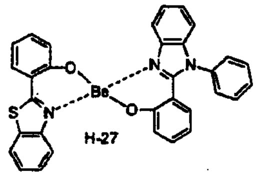
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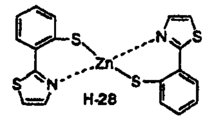
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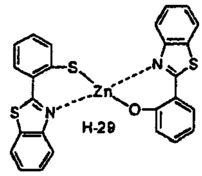
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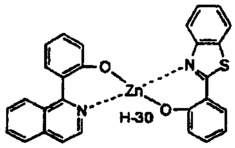
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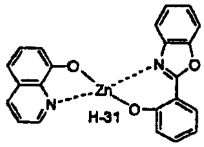
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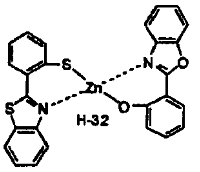
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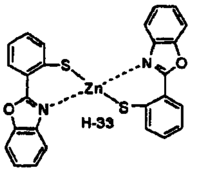
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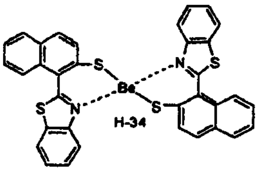
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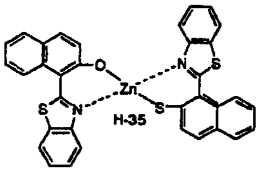
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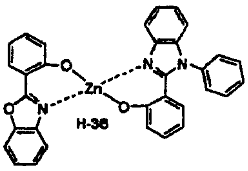
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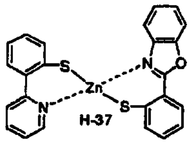
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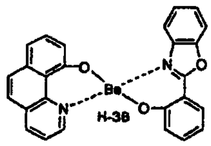
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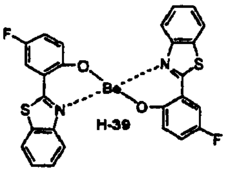
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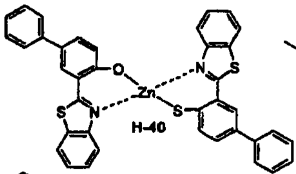
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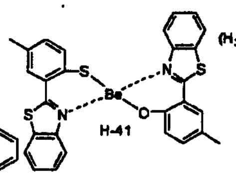
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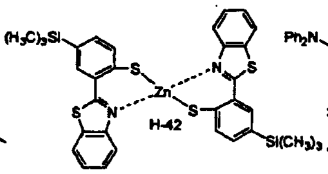
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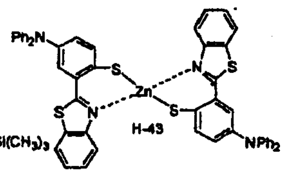
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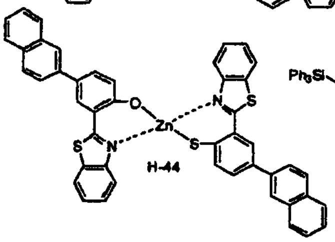
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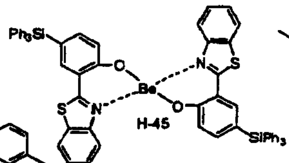
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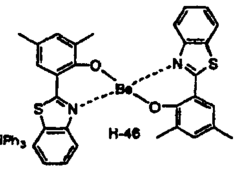
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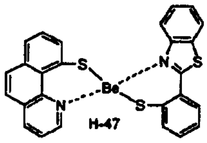
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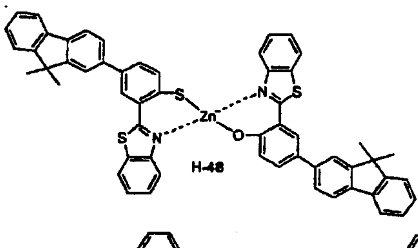
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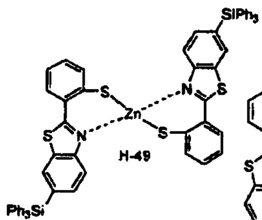
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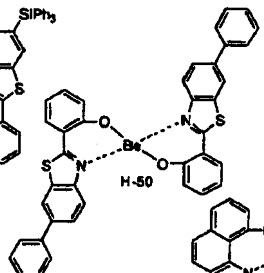
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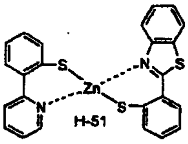
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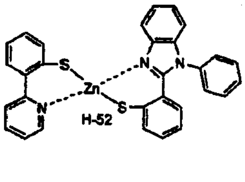
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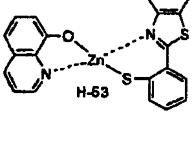
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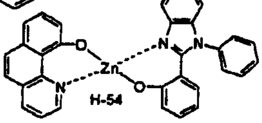
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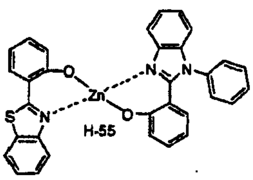
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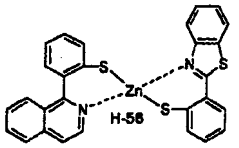
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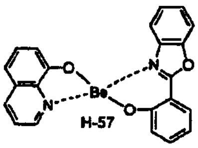
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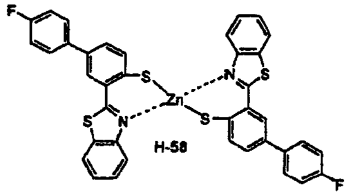
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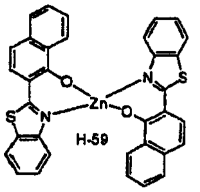
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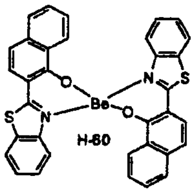
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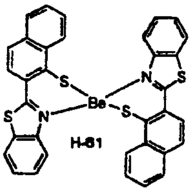
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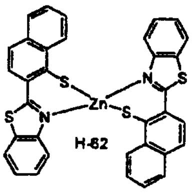
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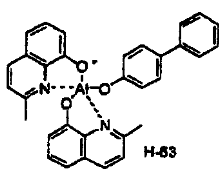
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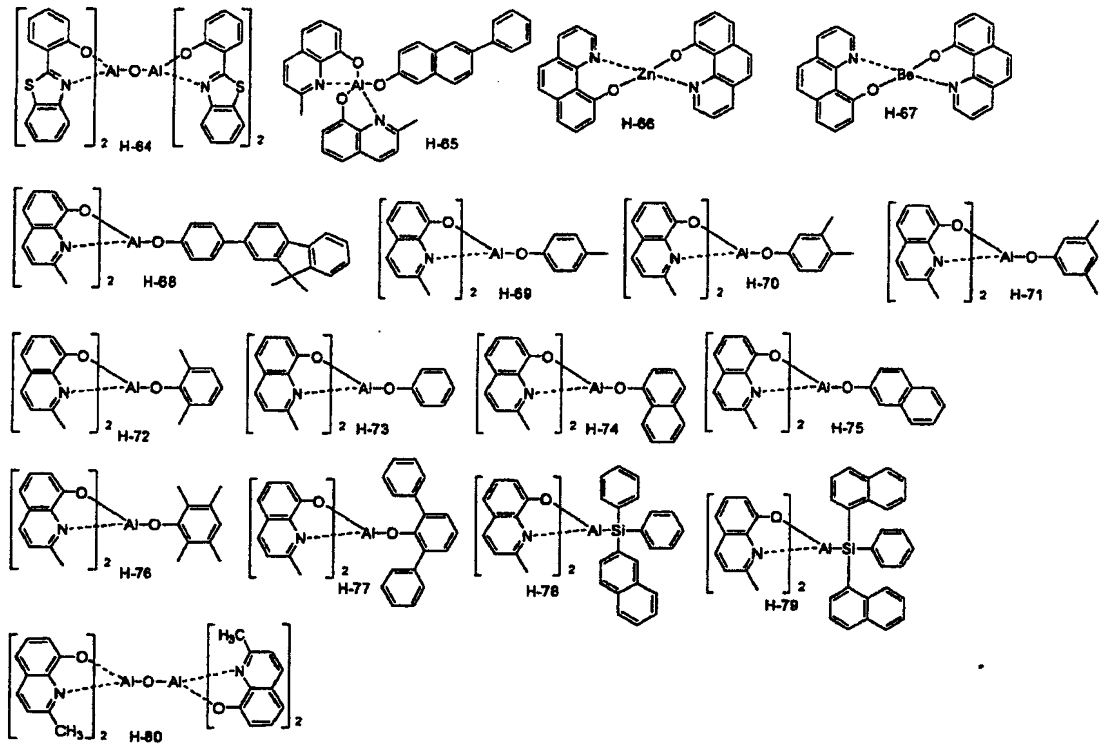
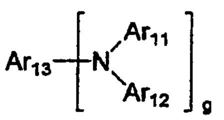


。

電場發光層意指發生電場發光的層，而且它可為單層或由兩層或更多層經積層所組成之多層。當根據本發明之解釋使用主體材料-摻雜物之混合物時，可證實裝置壽命及發光效率有明顯的改善。

根據本發明之有機電場發光裝置可進一步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)所表示之有機電場發光化合物。芳基胺或苯乙烯基芳基胺化合物包括由化學式(10)所表示之化合物，但不限於此：

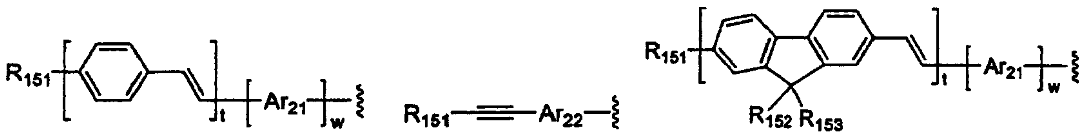
化學式(10)



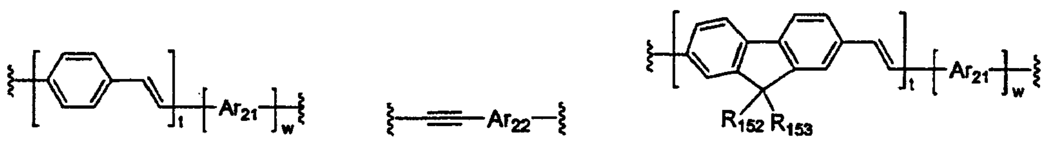
其中，Ar_{11} 和 Ar_{12} 獨立表示(C_1-C_{60})烷基、(C_6-C_{60})芳

基、(C_4-C_{60})雜芳基、(C_6-C_{60})芳基胺基、(C_1-C_{60})烷基胺基、含有一個或多個選自 N、O 及 S 之雜原子之 5-或 6-員雜環烷基或(C_3-C_{60})環烷基，或 Ar_{11} 和 Ar_{12} 可經由具有或是不具有稠合環之(C_3-C_{60})伸烷基或(C_3-C_{60})伸烯基相鏈結而形成脂環、或是單環或多環之芳香環；

當 g 為 1 時，Ar_{13} 表示(C_6-C_{60})芳基、(C_4-C_{60})雜芳基，或由以下結構之一者所表示之芳基：



當 g 為 2 時，Ar_{13} 表示(C_6-C_{60})伸芳基、(C_4-C_{60})伸雜芳基，或由以下結構之一者所表示之伸芳基：



其中，Ar_{11} 和 Ar_{12} 獨立表示(C_6-C_{60})伸芳基或(C_4-C_{60})伸雜芳基；

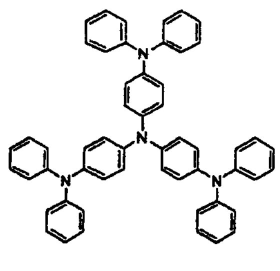
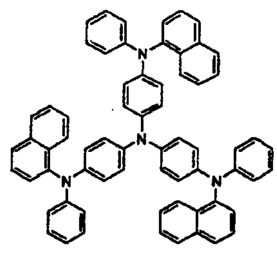
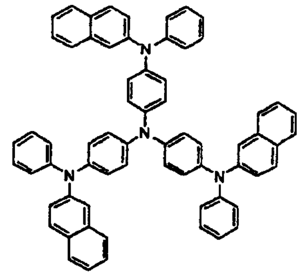
R_{151}、R_{152} 和 R_{153} 獨立表示氫、(C_1-C_{60})烷基或(C_6-C_{60})芳基；

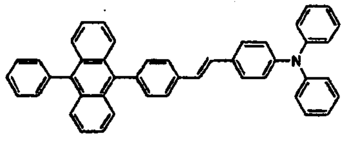
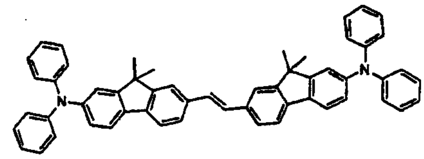
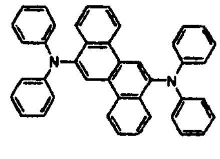
t 為 1 至 4 之整數，w 為整數 0 或 1；以及

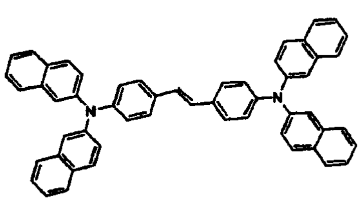
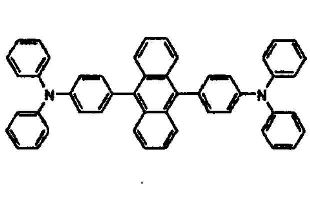
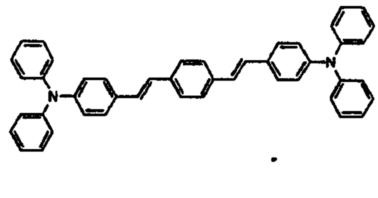
Ar_{11} 和 Ar_{12} 之烷基、芳基、雜芳基、芳基胺基、烷基胺基、環烷基或雜環烷基，或 Ar_{13} 之芳基、雜芳基、伸芳基或伸雜芳基，或 Ar_{21} 和 Ar_{22} 之伸芳基或伸雜芳基，或 R_{151} 至 R_{153} 之烷基或芳基可進一步經由一個或多個選自下列之

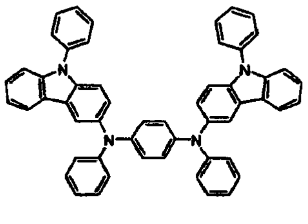
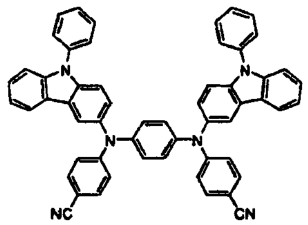
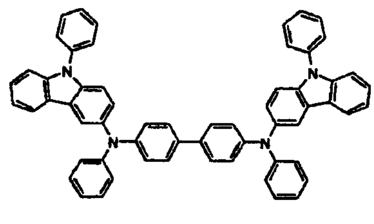
取代基取代：鹵素、(C_1-C_{60})烷基、(C_6-C_{60})芳基、(C_4-C_{60})雜芳基、含有一個或多個選自N、O以及S之雜原子之5-或6-員雜環烷基、(C_3-C_{60})環烷基、三(C_1-C_{60})烷基矽烷基、二(C_1-C_{60})烷基(C_6-C_{60})芳基矽烷基、三(C_6-C_{60})芳基矽烷基、金剛烷基、(C_7-C_{60})雙環烷基、(C_2-C_{60})烯基、(C_2-C_{60})炔基、氰、(C_1-C_{60})烷基胺基、(C_6-C_{60})芳基胺基、(C_6-C_{60})芳基(C_1-C_{60})烷基、(C_6-C_{60})芳氧基、(C_1-C_{60})烷氧基、(C_6-C_{60})芳硫基、(C_1-C_{60})烷硫基、(C_1-C_{60})烷氧基羰基、(C_1-C_{60})烷基羰基、(C_6-C_{60})芳基羰基、羧基、硝基以及羥基。

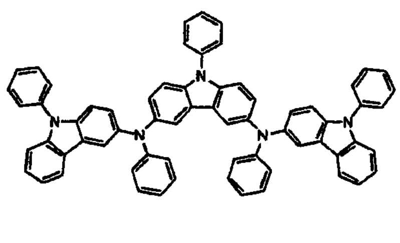
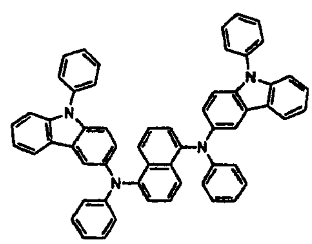
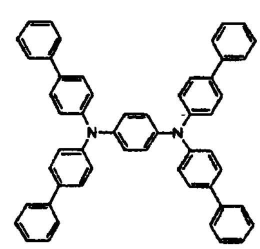
芳基胺化合物與苯乙烯基芳基胺化合物可更具體地，但不限於，以下化合物例示：

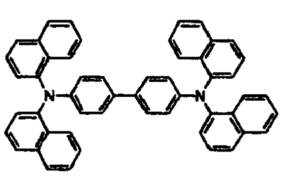
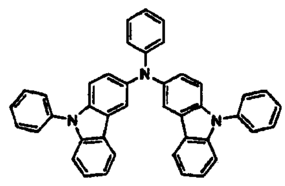
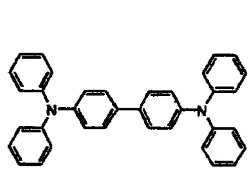
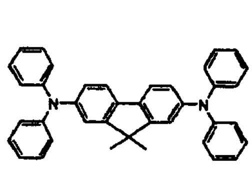




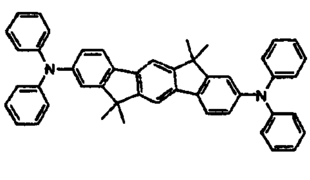
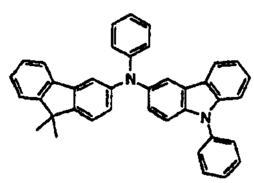
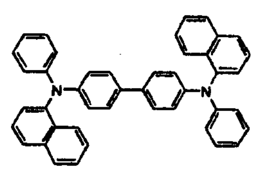




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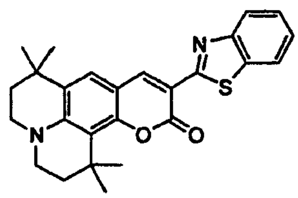
在根據本發明之有機電場發光裝置中，有機層可進一步包括一種或多種選自由第 1 族有機金屬、第 2 族有機金屬、第 4 週期與第 5 週期過渡金屬、鑭族金屬及 d-過渡元

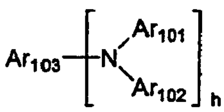
素所構成的群組，以及化學式(1)所表示之有機電場發光化合物。除了電場發光層之外，有機層可包括電荷產生層。本發明可實現具有獨立的發光模式的像素結構之電場發光裝置，其包括有機電場發光裝置，該有機電場發光裝置含有由化學式(1)所表示之化合物作為次像素，以及包括一種或多種選自芳基胺化合物與苯乙烯基芳基胺化合物所組成群組之化合物之一種或多種次像素，係同時經平行圖案化。

另外，有機電場發光裝置為有機顯示器，其同時包括一種或多種選自下列之化合物：具有藍色或綠色波長之電場發光峰的化合物。該等具有藍色或綠色波長之電場發光峰的化合物可藉由，但不限於，化學式(11)至(15)之一者所表示之化合物例示。

化學式(11)



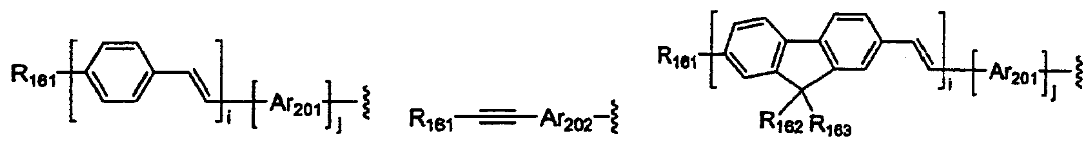
化學式(12)



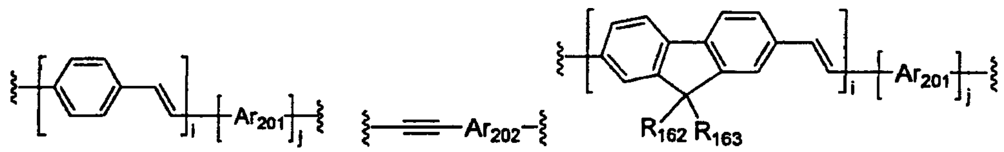
在化學式(120)中，Ar_{101} 和 Ar_{102} 獨立表示(C_1-C_{60})烷基、(C_6-C_{60})芳基、(C_4-C_{60})雜芳基、(C_6-C_{60})芳基胺基、(C_1-C_{60})烷基胺基、含有一個或多個選自 N、O 及 S 之雜原子之 5-或 6-員雜環烷基或(C_3-C_{30})環烷基、或 Ar_{101} 和 Ar_{102} 可經由具有或是不具有稠合環之(C_3-C_{60})伸烷基或(C_3-C_{60})伸烯基

相鏈結而形成脂環、或是單環或多環之芳香環；

當 h 為 1 時，Ar_{103} 表示(C_6-C_{60})芳基、(C_4-C_{60})雜芳基、或由以下結構所表示之芳基：



當 h 為 2 時，Ar_{103} 表示(C_6-C_{60})伸芳基、(C_4-C_{60})伸雜芳基、或由以下結構所表示之伸芳基：



其中，Ar_{101} 和 Ar_{102} 獨立表示(C_6-C_{60})伸芳基或(C_4-C_{60})伸雜芳基；

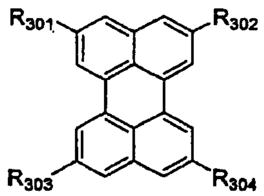
R_{161}、R_{162} 和 R_{163} 獨立表示氫、(C_1-C_{60})烷基或(C_6-C_{60})芳基；

i 為 1 至 4 之整數，j 為整數 0 或 1；以及

Ar_{101} 和 Ar_{102} 之烷基、芳基、雜芳基、芳基胺基、烷基胺基、環烷基或雜環烷基，或 Ar_{103} 之芳基、雜芳基、伸芳基或伸雜芳基，或 Ar_{201} 和 Ar_{202} 之伸芳基或伸雜芳基，或 R_{161} 至 R_{163} 之烷基或芳基可進一步經由一個或多個選自下列之取代基取代：鹵素、(C_1-C_{60})烷基、(C_6-C_{60})芳基、(C_4-C_{60})雜芳基、含有一個或多個選自 N、O 以及 S 之雜原子之 5-或 6-員雜環烷基、(C_3-C_{60})環烷基、三(C_1-C_{60})烷基矽烷基、二(C_1-C_{60})烷基(C_6-C_{60})芳基矽烷基、三(C_6-C_{60})芳基矽烷

基、金剛烷基、(C_7-C_{60})雙環烷基、(C_2-C_{60})烯基、(C_2-C_{60})炔基、氰、(C_1-C_{60})烷基胺基、(C_6-C_{60})芳基胺基、(C_6-C_{60})芳基(C_1-C_{60})烷基、(C_6-C_{60})芳氧基、(C_1-C_{60})烷氧基、(C_6-C_{60})芳硫基、(C_1-C_{60})烷硫基、(C_1-C_{60})烷氧基羰基、(C_1-C_{60})烷基羰基、(C_6-C_{60})芳基羰基、羧基、硝基以及羥基。

化學式(13)



在化學式(13)中，R_{301}至R_{304}獨立表示氫、鹵素、(C_1-C_{60})烷基、(C_6-C_{60})芳基、(C_4-C_{60})雜芳基、含有一個或多個選自N、O及S之雜原子之5-或6-員雜環烷基、(C_3-C_{60})環烷基、三(C_1-C_{60})烷基矽烷基、二(C_1-C_{60})烷基(C_6-C_{60})芳基矽烷基、三(C_6-C_{60})芳基矽烷基、金剛烷基、(C_7-C_{60})雙環烷基、(C_2-C_{60})烯基、(C_2-C_{60})炔基、氰、(C_1-C_{60})烷基胺基、(C_6-C_{60})芳基胺基、(C_6-C_{60})芳基(C_1-C_{60})烷基、(C_1-C_{60})烷氧基、(C_1-C_{60})烷硫基、(C_6-C_{60})芳氧基、(C_6-C_{60})芳硫基、(C_1-C_{60})烷氧基羰基、(C_1-C_{60})烷基羰基、(C_6-C_{60})芳基羰基、羧基、硝基或羥基，或R_{301}至R_{304}之各者可經由具有或是不具有稠合環之(C_3-C_{60})伸烷基或(C_3-C_{60})伸烯基鏈結至一相鄰取代基而形成脂環、或是單環或多環之芳香環；

R_{301}至R_{304}之烷基、烯基、炔基、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、或芳基胺基、或R_{301}至R_{304}經由具有或是不具有稠合環(C_3-C_{60})

伸烷基或(C_3-C_{60})伸烯基鏈結至一相鄰取代基所形成的該脂環、或單環或多環之芳香環可進一步經由一個或多個選自下列之取代基取代：鹵素、(C_1-C_{60})烷基、(C_6-C_{60})芳基、(C_4-C_{60})雜芳基、含有一個或多個選自 N、O 以及 S 之雜原子之 5-或 6-員雜環烷基、(C_3-C_{60})環烷基、三(C_1-C_{60})烷基矽烷基、二(C_1-C_{60})烷基(C_6-C_{60})芳基矽烷基、三(C_6-C_{60})芳基矽烷基、金剛烷基、(C_7-C_{60})雙環烷基、(C_2-C_{60})烯基、(C_2-C_{60})炔基、氰、(C_1-C_{60})烷基胺基、(C_6-C_{60})芳基胺基、(C_6-C_{60})芳基(C_1-C_{60})烷基、(C_1-C_{60})烷氧基、(C_1-C_{60})烷硫基、(C_6-C_{60})芳氧基、(C_6-C_{60})芳硫基、(C_1-C_{60})烷氧基羰基、(C_1-C_{60})烷基羰基、(C_6-C_{60})芳基羰基、羧基、硝基以及羥基。

化學式(14)

$(Ar_{301})_p-L_{11}-(Ar_{302})_q$

化學式(15)

$(Ar_{303})_r-L_{12}-(Ar_{304})_s$

在化學式(14)和(15)中，L_{11} 表示(C_6-C_{60})伸芳基或(C_4-C_{60})伸雜芳基；

L_{12}表示伸蒽基(antrhacenylene)；

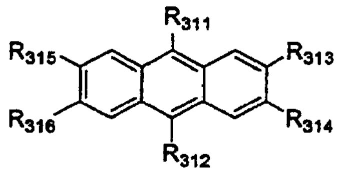
Ar_{301} 至 Ar_{304}獨立選自氫、(C_1-C_{60})烷基、(C_1-C_{60})烷氧基、鹵素、(C_4-C_{60})雜芳基、(C_5-C_{60})環烷基及(C_6-C_{60})芳基，而且 Ar_{301} 至 Ar_{304}之環烷基、芳基或雜芳基可進一步經由一個或多個選自下列之取代基取代：具有或不具有至少一個選自由(C_1-C_{60})烷基、鹵代(C_1-C_{60})烷基、(C_1-C_{60})烷氧基、

(C_3-C_{60})環烷基、鹵素、氰、三(C_1-C_{60})烷基矽烷基、二(C_1-C_{60})烷基(C_6-C_{60})芳基矽烷基以及三(C_6-C_{60})芳基矽烷基所組成之群組之取代基取代之(C_6-C_{60})芳基或(C_4-C_{60})雜芳基、具有或不具有鹵素取代基之(C_1-C_{60})烷基、(C_1-C_{60})烷氧基、(C_3-C_{60})環烷基、鹵素、氰、三(C_1-C_{60})烷基矽烷基、二(C_1-C_{60})烷基(C_6-C_{60})芳基矽烷基以及三(C_6-C_{60})芳基矽烷基；以及

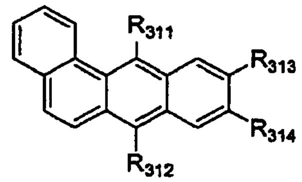
p、q、r 以及 s 獨立表示 0 至 4 之整數。

化學式(14)或(15)所表示之化合物可由化學式(16)至(19)之一者所表示之蒽衍生物與苯并[a]蒽衍生物例示。

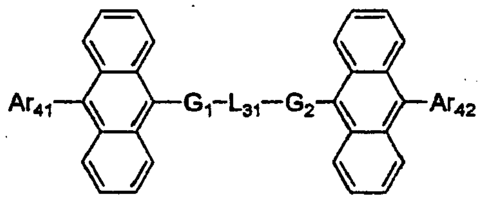
化學式(16)



化學式(17)



化學式(18)



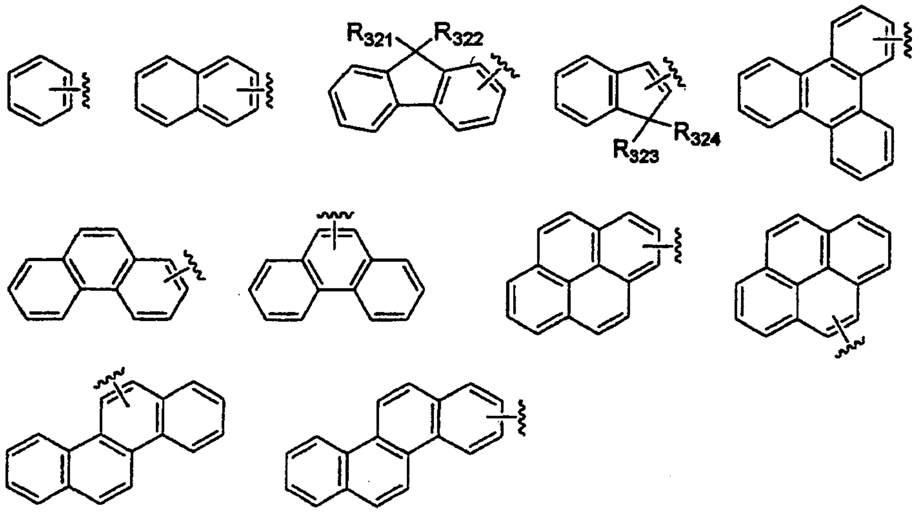
在化學式(16)至(18)中，R_{311} 與 R_{312} 獨立表示(C_6-C_{60})芳基、(C_4-C_{60})雜芳基、或含有一個或多個選自 N、O 及 S 之雜原子之 5-或 6-員雜環烷基、或(C_3-C_{60})環烷基，而且

R_{311}與R_{312}之芳基或雜芳基可進一步經由一個或多個選自下列各者所組成之群組之取代基取代：(C_1-C_{60})烷基、鹵代(C_1-C_{60})烷基、(C_1-C_{60})烷氧基、(C_3-C_{60})環烷基、(C_6-C_{60})芳基、(C_4-C_{60})雜芳基、鹵素、氰、三(C_1-C_{60})烷基矽烷基、二(C_1-C_{60})烷基(C_6-C_{60})芳基矽烷基以及三(C_6-C_{60})芳基矽烷基；

R_{311}至R_{316}獨立表示氫、(C_1-C_{60})烷基、(C_1-C_{60})烷氧基、鹵素、(C_4-C_{60})雜芳基、(C_5-C_{60})環烷基或(C_6-C_{60})芳基，而且R_{313}至R_{316}之雜芳基、環烷基或芳基可進一步經由一個或多個選自下列各者所組成之群組之取代基取代：具有或不具有鹵素取代基之(C_1-C_{60})烷基、(C_1-C_{60})烷氧基、(C_3-C_{60})環烷基、鹵素、氰、三(C_1-C_{60})烷基矽烷基、二(C_1-C_{60})烷基(C_6-C_{60})芳基矽烷基以及三(C_6-C_{60})芳基矽烷基；

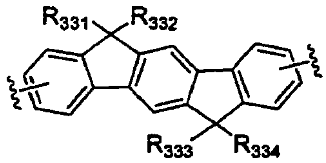
G_1與G_2獨立表示化學鍵或具有或不具有一個或多個選自下列之取代基之(C_6-C_{60})伸芳基：(C_1-C_{60})烷基、(C_1-C_{60})烷氧基、(C_6-C_{60})芳基、(C_4-C_{60})雜芳基以及鹵素；

Ar_{41}與Ar_{42}表示選自由以下結構之芳基或(C_4-C_{60})雜芳基：



Ar_{41} 與 Ar_{42} 之芳基或雜芳基可經由一個或多個選自下列之取代基取代：(C_1-C_{60})烷基、(C_1-C_{60})烷氧基、(C_6-C_{60})芳基以及(C_4-C_{60})雜芳基；

L_{31} 表示(C_6-C_{60})伸芳基、(C_4-C_{60})伸雜芳基或由以下結構所表示之化合物：

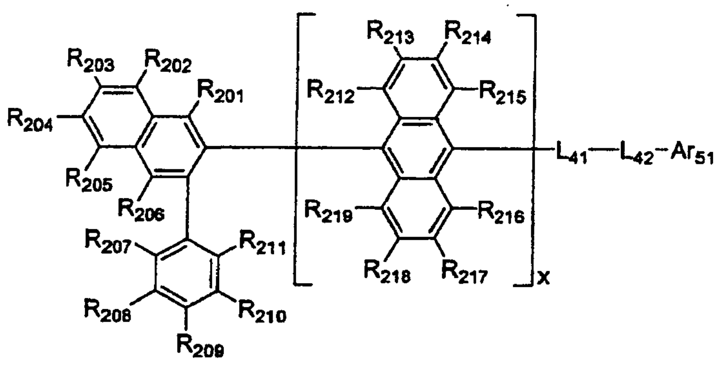


L_{31} 之伸芳基或伸雜芳基可經由一個或多個選自下列之取代基取代：(C_1-C_{60})烷基、(C_1-C_{60})烷氧基、(C_6-C_{60})芳基、(C_4-C_{60})雜芳基以及鹵素；

R_{321}、R_{322}、R_{323} 以及 R_{324} 獨立表示氫、(C_1-C_{60})烷基或(C_6-C_{60})芳基，或它們每一者可經由具有或是不具有稠合環之(C_3-C_{60})伸烷基或(C_3-C_{60})伸烯基鏈結至相鄰取代基而形成脂環、或是單環或多環之芳香環；

R_{331}、R_{332}、R_{333} 以及 R_{334} 獨立表示氫、(C_1-C_{60})烷基、(C_1-C_{60})烷氧基、(C_6-C_{60})芳基、或(C_4-C_{60})雜芳基或鹵素，或它們每一者可經由具有或是不具有稠合環之(C_3-C_{60})伸烷基或(C_3-C_{60})伸烯基鏈結至一相鄰取代基而形成脂環、或是單環或多環之芳香環。

化學式(19)

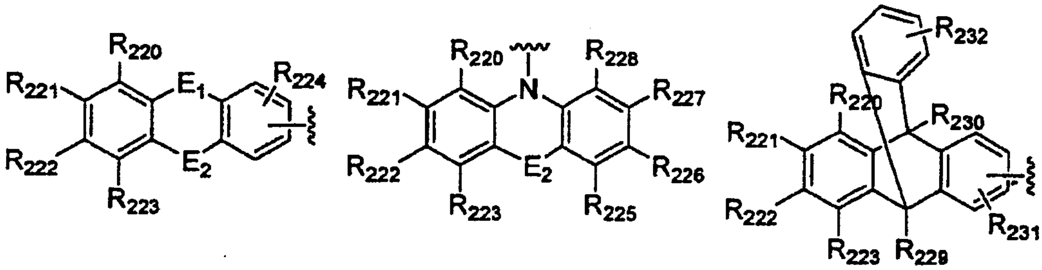


在化學式(19)，L_{41}與L_{42}獨立表示化學鍵，或(C_6-C_{60})伸芳基或(C_3-C_{60})伸雜芳基，而且L_{41}與L_{42}之伸芳基或伸雜芳基可進一步經由一個或多個選自下列之取代基取代：(C_1-C_{60})烷基、鹵素、氰、(C_1-C_{60})烷氧基、(C_3-C_{60})環烷基、(C_6-C_{60})芳基、(C_3-C_{60})雜芳基、三(C_1-C_{30})烷基矽烷基、二(C_1-C_{30})烷基(C_6-C_{30})芳基矽烷基以及三(C_6-C_{30})芳基矽烷基；

R_{201}至R_{219}獨立表示氫、鹵素、(C_1-C_{60})烷基、(C_6-C_{60})芳基、(C_4-C_{60})雜芳基、含有一個或多個選自N、O及S之雜原子之5-或6-員雜環烷基、(C_3-C_{60})環烷基、三(C_1-C_{60})烷基矽烷基、二(C_1-C_{60})烷基(C_6-C_{60})芳基矽烷基、三(C_6-C_{60})芳基矽烷基、金剛烷基、(C_7-C_{60})雙環烷基、(C_2-C_{60})烯基、(C_1-C_{60})炔基、(C_1-C_{60})烷氧基、氰、(C_1-C_{60})烷基胺基、(C_6-C_{60})芳基胺基、(C_6-C_{60})芳基(C_1-C_{60})烷基、(C_6-C_{60})芳氧基、(C_6-C_{60})芳硫基、(C_1-C_{60})烷氧基羰基、羧基、硝基或羥基，或R_{201}至R_{219}之各者可經由具有或是不具有稠合環之(C_3-C_{60})伸烷基或(C_3-C_{60})伸烯基鏈結至一相鄰取代基而形成脂環、或是單環或多環之芳香環；

Ar_{51}表示(C_6-C_{60})芳基、(C_4-C_{60})雜芳基或含有一個或多

個選自 N、O 及 S 之雜原子之 5-或 6-員雜環烷基、(C_3-C_{60})環烷基、金剛烷基、(C_7-C_{60})雙環烷基、或選自下列結構之取代基：



R_{220} 至 R_{232} 獨立表示氫、鹵素、(C_1-C_{60})烷基、(C_6-C_{60})芳基、(C_4-C_{60})雜芳基、含有一個或多個選自 N、O 以及 S 之雜原子之 5-或 6-員雜環烷基、(C_3-C_{60})環烷基、三(C_1-C_{60})烷基矽烷基、二(C_1-C_{60})烷基(C_6-C_{60})芳基矽烷基、三(C_6-C_{60})芳基矽烷基、金剛烷基、(C_7-C_{60})雙環烷基、(C_2-C_{60})烯基、(C_2-C_{60})炔基、(C_1-C_{60})烷氧基、氰、(C_1-C_{60})烷基胺基、(C_6-C_{60})芳基胺基、(C_6-C_{60})芳基(C_1-C_{60})烷基、(C_6-C_{60})芳氧基、(C_6-C_{60})芳硫基、(C_1-C_{60})烷氧基羰基、羧基、硝基或羥基；

E_1 與 E_2 獨立表示化學鍵、$-(CR_{233}R_{234})_z-$、$-N(R_{235})-$、$-S-$、$-O-$、$-Si(R_{236})(R_{237})-$、$-P(R_{238})-$、$-C(=O)-$、$-B(R_{239})-$、$-In(R_{240})-$、$-Se-$、$-Ge(R_{241})(R_{242})-$、$-Sn(R_{243})(R_{244})-$、$-Ga(R_{245})-$或$-C(R_{246})=C(R_{247})-$；

R_{233} 至 R_{247} 獨立表示氫、鹵素、(C_1-C_{60})烷基、(C_6-C_{60})芳基、(C_4-C_{60})雜芳基、含有一個或多個選自 N、O 及 S 之雜原子之 5-或 6-員雜環烷基、(C_3-C_{60})環烷基、三(C_1-C_{60})烷基矽烷基、二(C_1-C_{60})烷基(C_6-C_{60})芳基矽烷基、三(C_6-C_{60})芳基矽烷基、金剛烷基、(C_7-C_{60})雙環烷基、(C_2-C_{60})烯基、

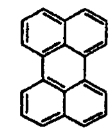
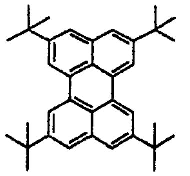
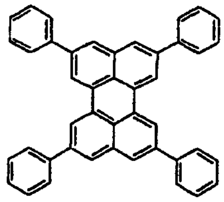
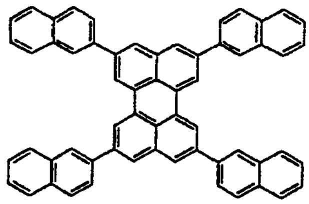
(C_2-C_{60})炔基、(C_1-C_{60})烷氧基、氰、(C_1-C_{60})烷基胺基、(C_6-C_{60})芳基胺基、(C_6-C_{60})芳基(C_1-C_{60})烷基、(C_6-C_{60})芳氧基、(C_6-C_{60})芳硫基、(C_1-C_{60})烷氧基羰基、羧基、硝基，或羥基，或R_{233}至R_{232}之各者可經由具有或是不具有稠合環之(C_3-C_{60})伸烷基或(C_3-C_{60})伸烯基鏈結至一相鄰取代基而形成脂環、或是單環或多環之芳香環；

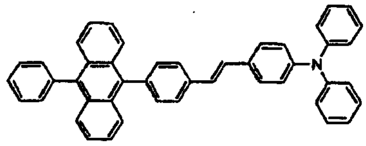
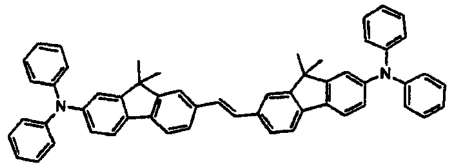
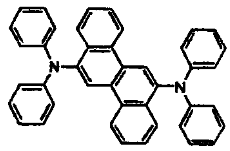
Ar_{51}之芳基、雜芳基、雜環烷基、金剛烷基或雙環烷基、或R_{201}至R_{232}之烷基、烯基、炔基、環烷基、雜環烷基、芳基、雜芳基、芳基矽烷基、烷基矽烷基、烷基胺基或芳基胺基可進一步經由一個或多個選自下列之取代基取代：鹵素、(C_1-C_{60})烷基、(C_6-C_{60})芳基、(C_4-C_{60})雜芳基、含有一個或多個選自N、O及S雜原子之5-或6-員之雜芳烷基、(C_3-C_{60})環烷基、三(C_1-C_{60})烷基矽烷基、二(C_1-C_{60})烷基(C_6-C_{60})芳基矽烷基、三(C_6-C_{60})芳基矽烷基、金剛烷基、(C_7-C_{60})雙環烷基、(C_2-C_{60})烯基、(C_2-C_{60})炔基、(C_1-C_{60})烷氧基、氰、(C_1-C_{60})烷基胺基、(C_6-C_{60})芳基胺基、(C_6-C_{60})芳基(C_1-C_{60})烷基、(C_6-C_{60})芳氧基、(C_6-C_{60})芳硫基、(C_1-C_{60})烷氧基羰基、羧基、硝基以及羥基；

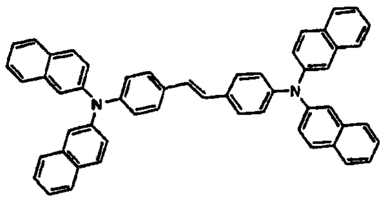
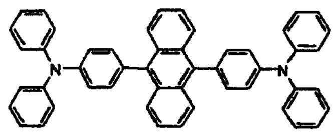
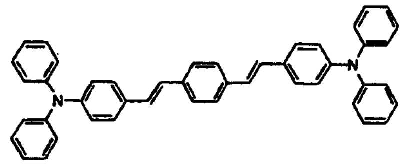
X為1至4之整數；以及

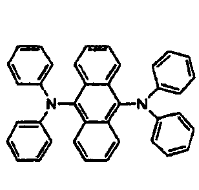
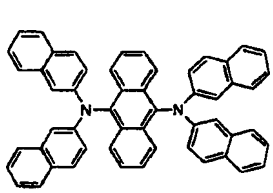
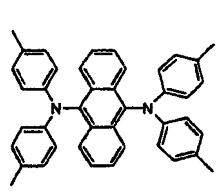
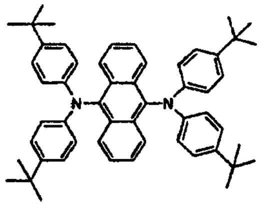
Z為0至4之整數。

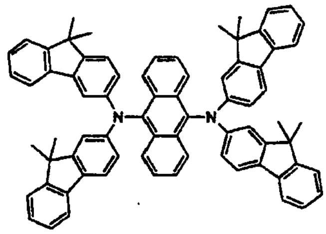
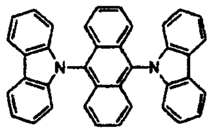
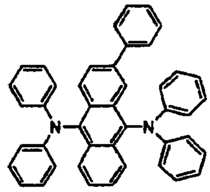
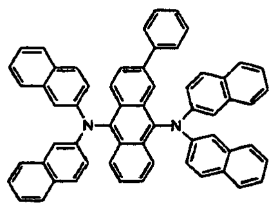
具有綠色或藍色電場發光之有機化合物及有機金屬化合物可更具體地藉由，但不限於，下列結構所例示。

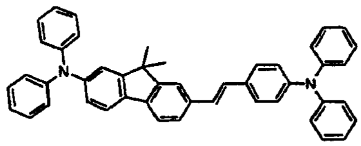
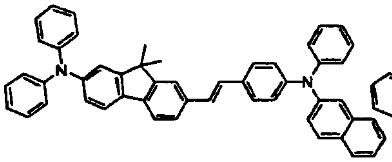
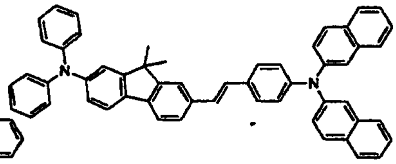





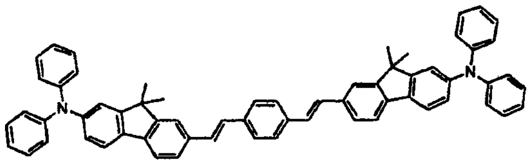
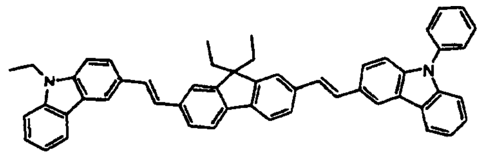




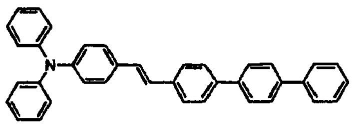
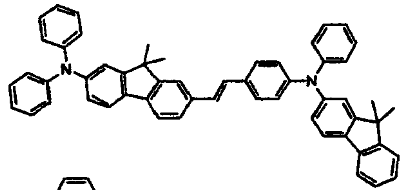




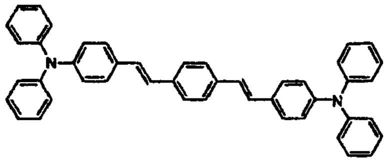
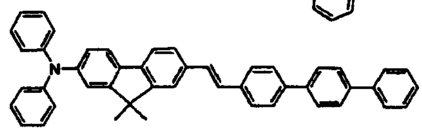





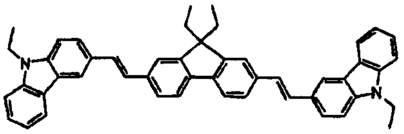
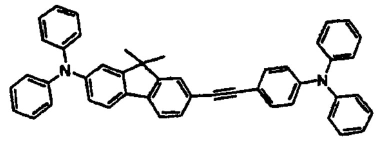





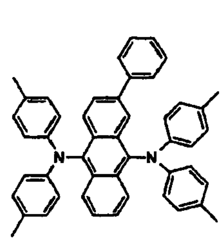
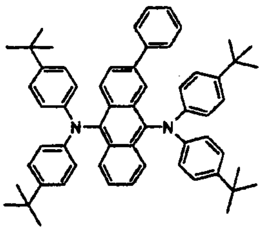
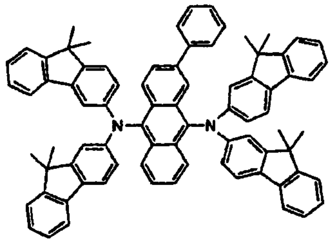
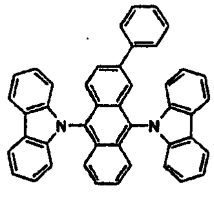




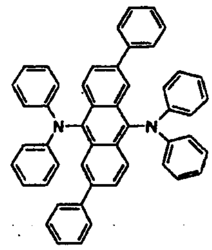
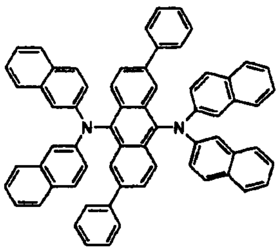
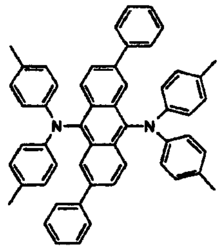
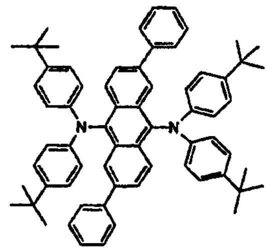



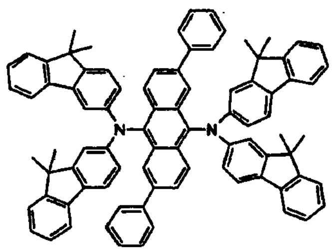
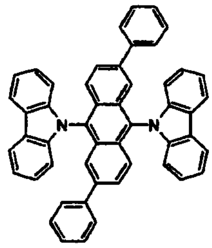
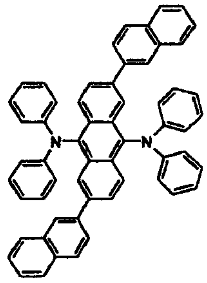
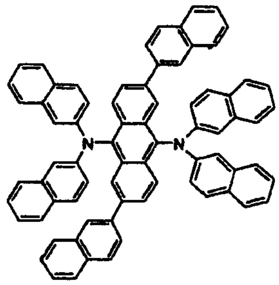



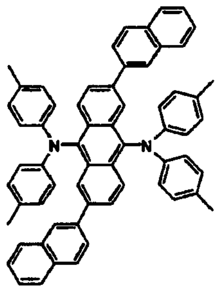
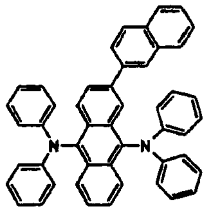
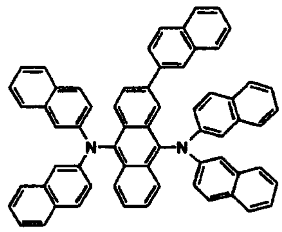
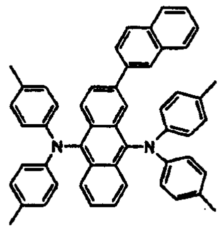



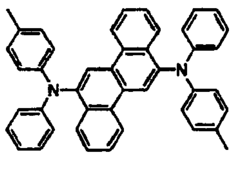
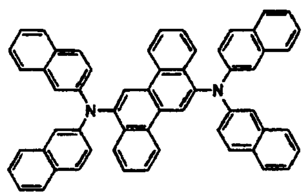
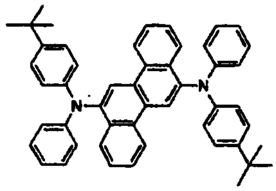



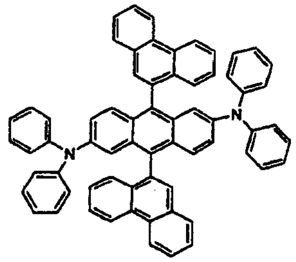
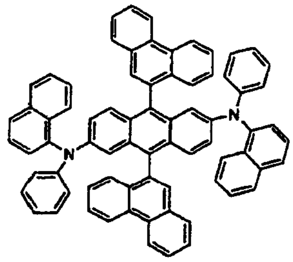
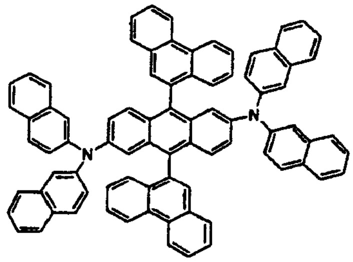





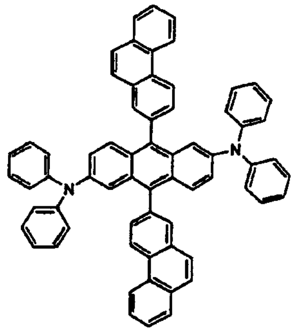
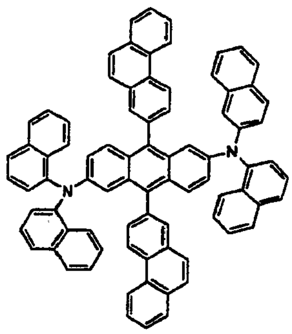
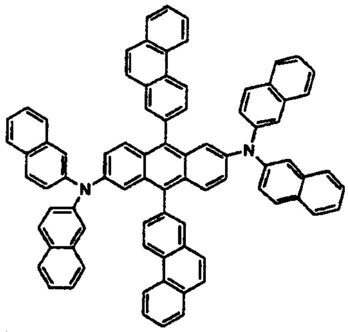





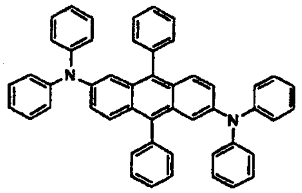
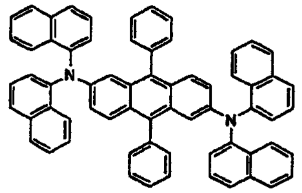
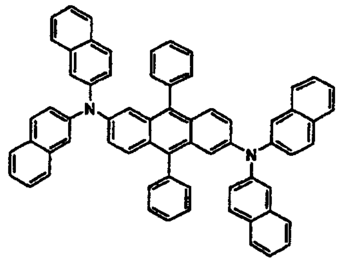





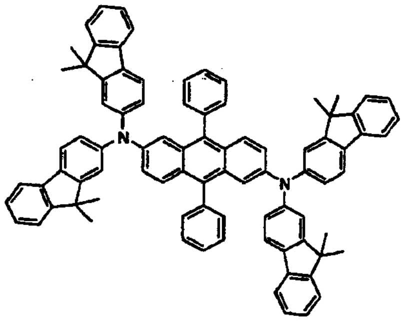
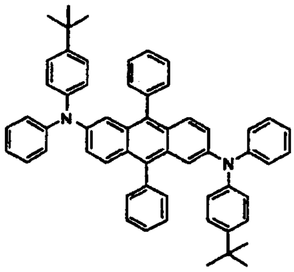
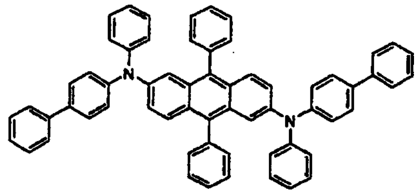





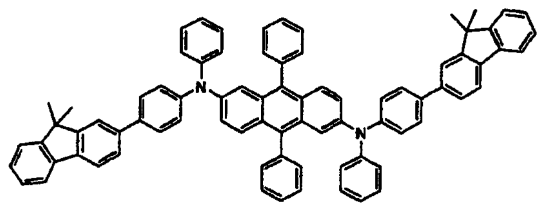
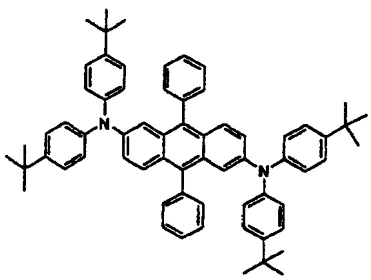




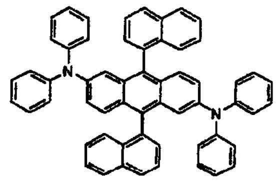
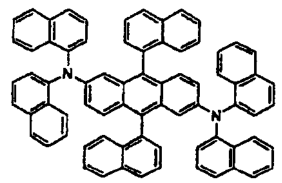
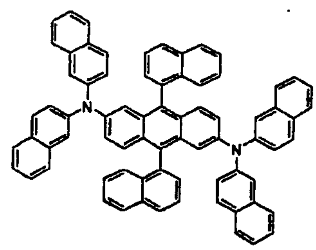
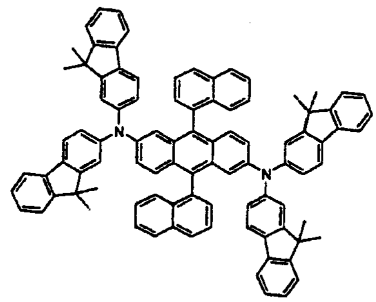
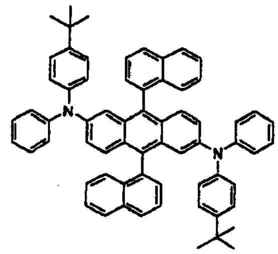
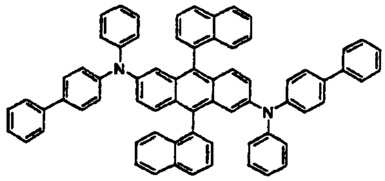
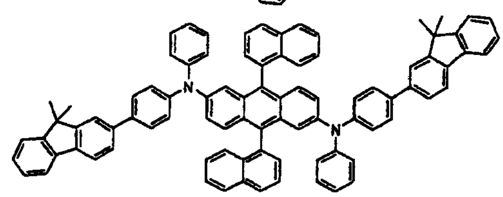
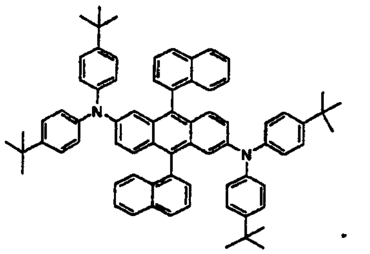
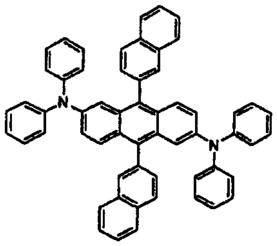
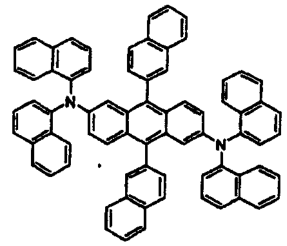
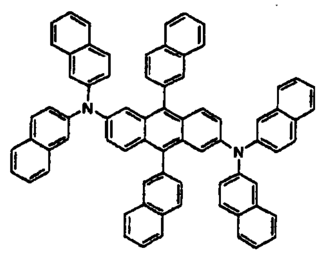
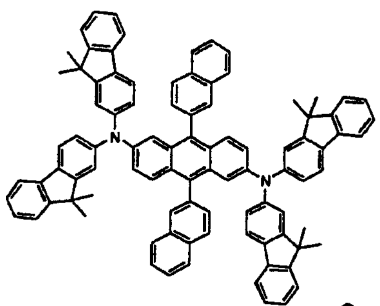
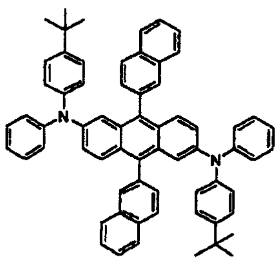
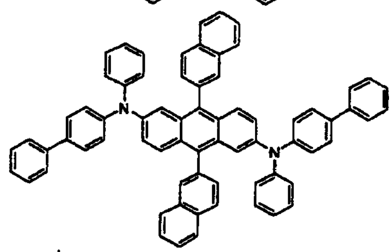
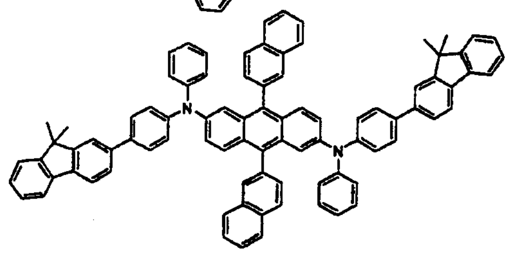
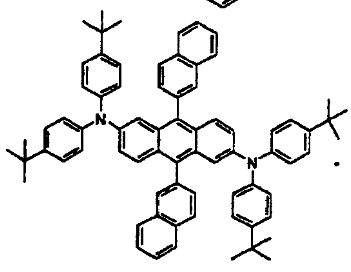
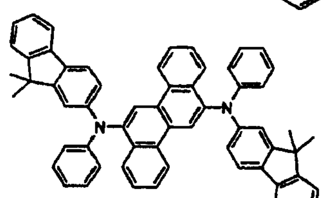
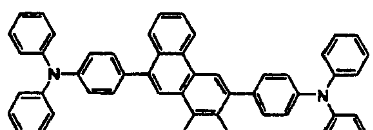
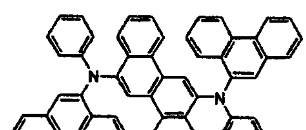




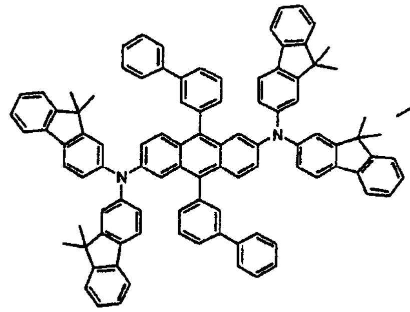
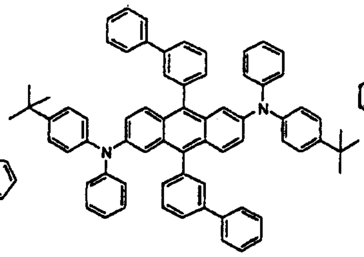
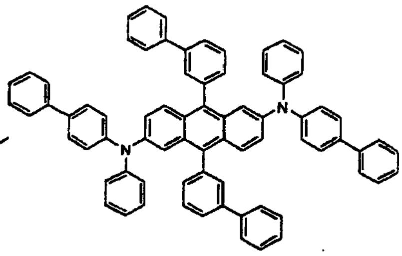




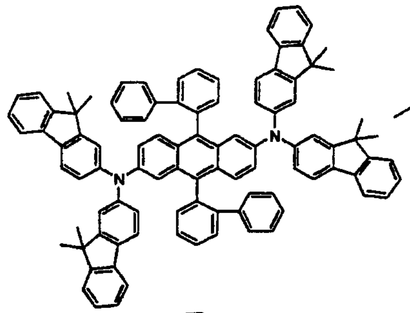
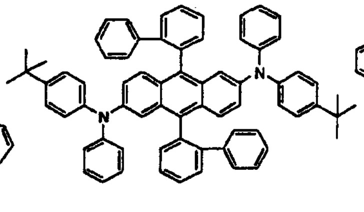
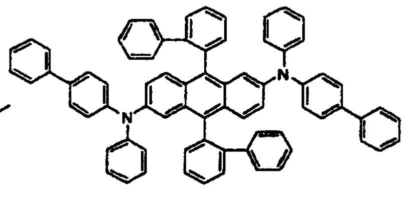




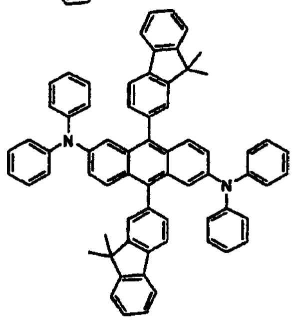
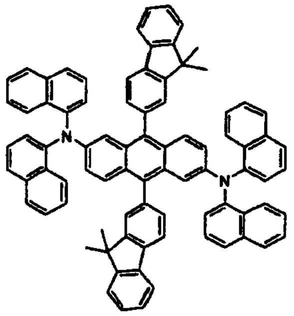
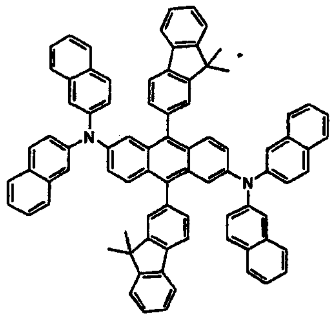




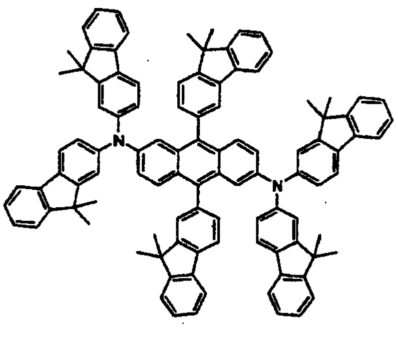
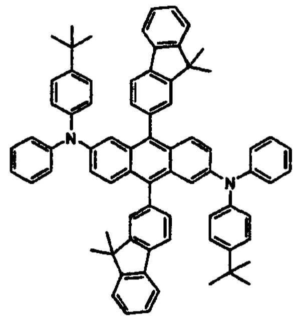
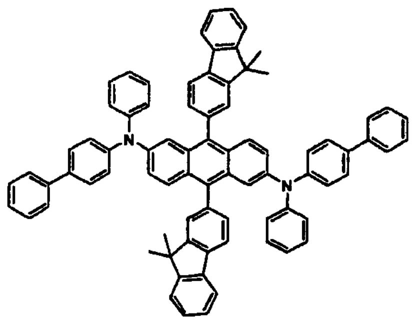



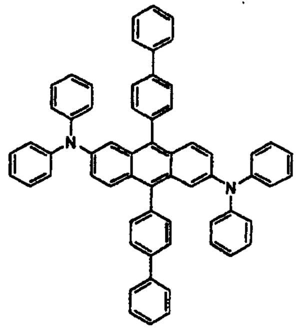




















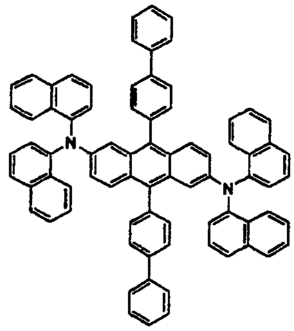
  

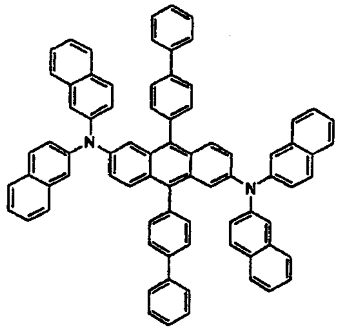
  

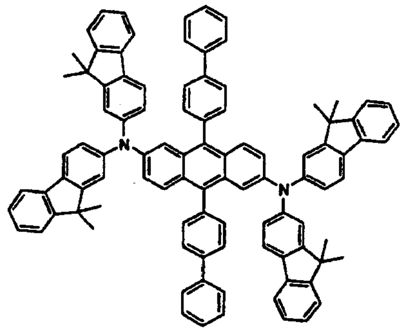
  

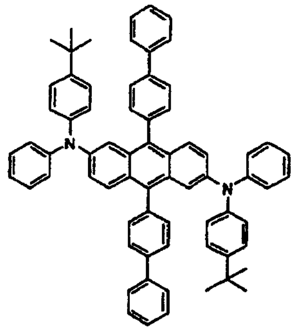
  

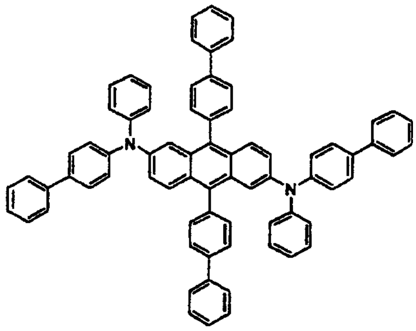


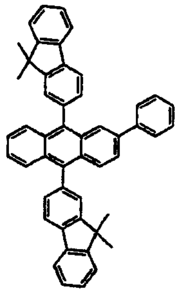


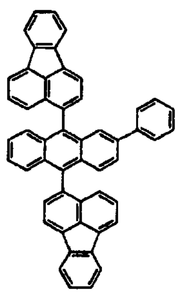


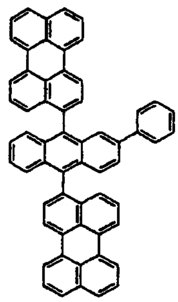


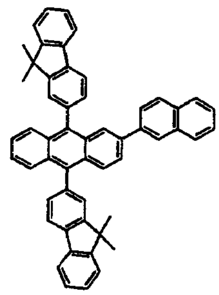


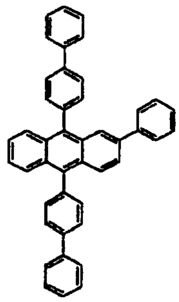


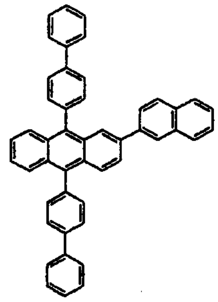


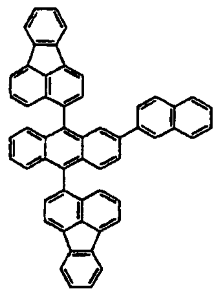


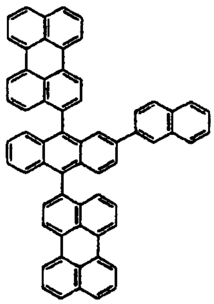


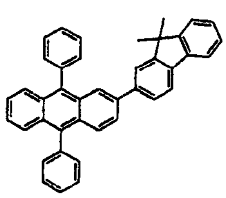
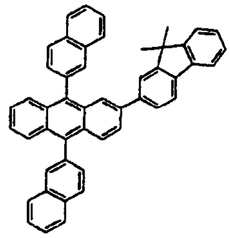
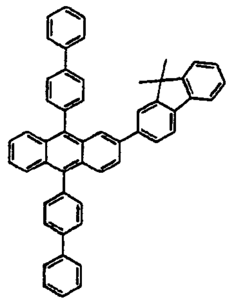
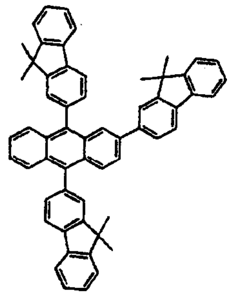
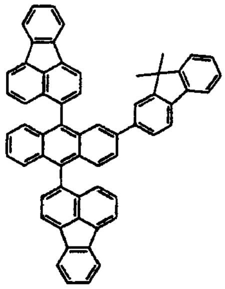
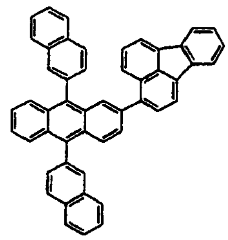
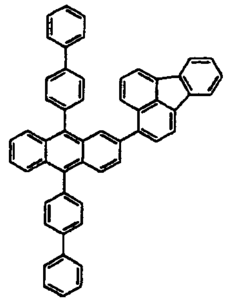
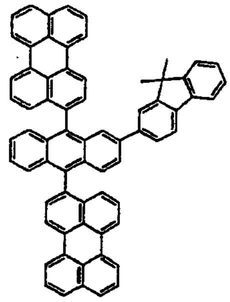
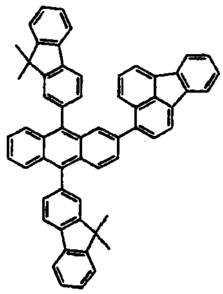
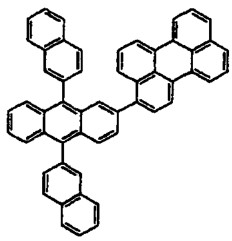
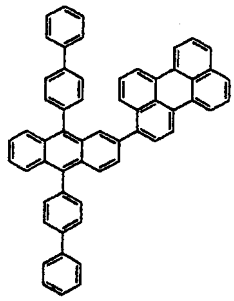
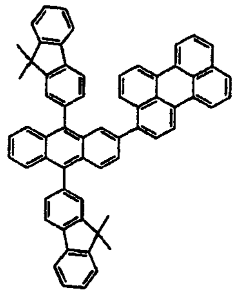
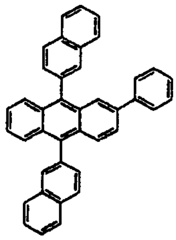
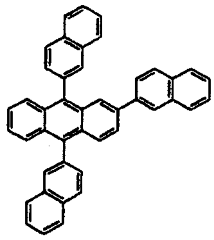
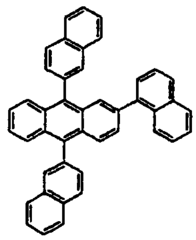
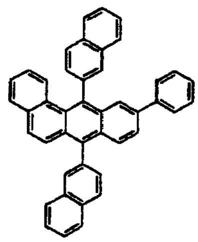
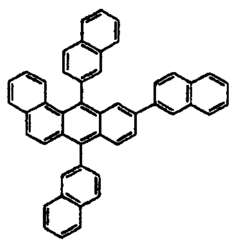


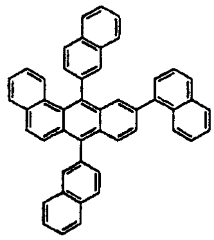
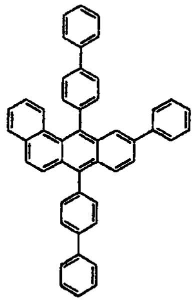
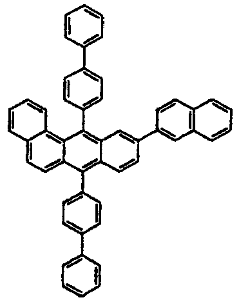
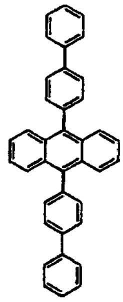
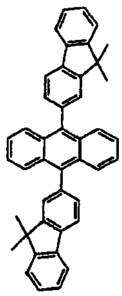
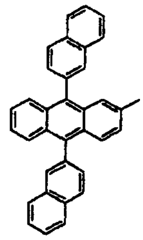


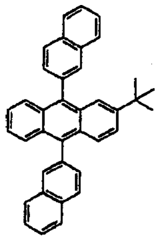
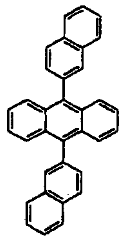
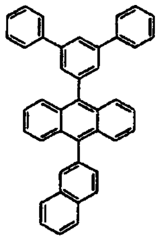
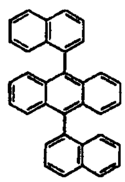
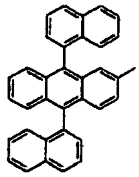
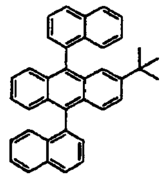


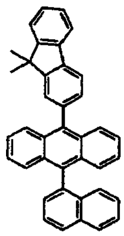
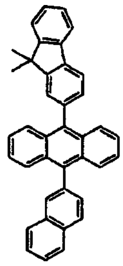
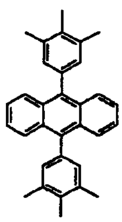
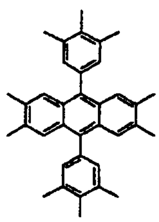
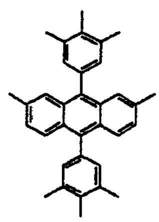
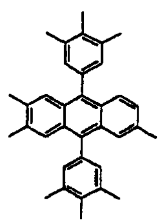


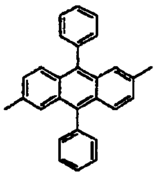
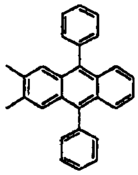
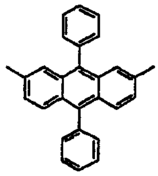
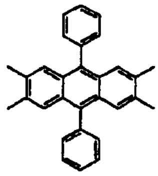
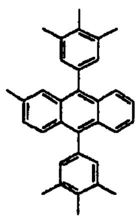
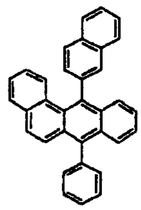


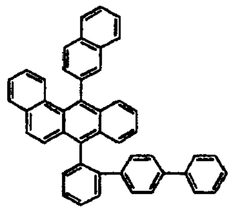
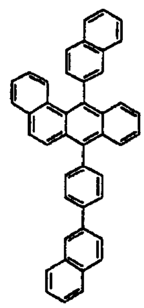
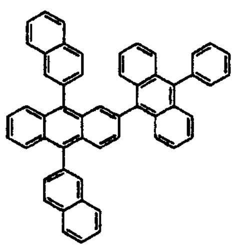
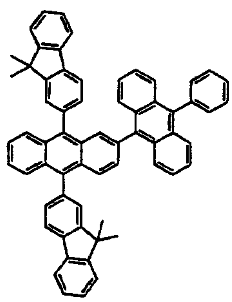


















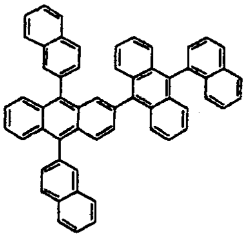
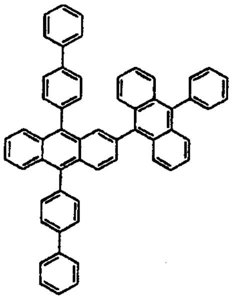
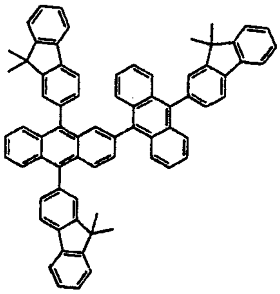
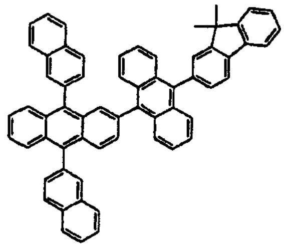
     

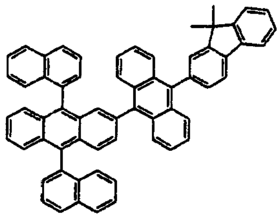
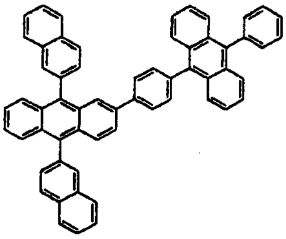
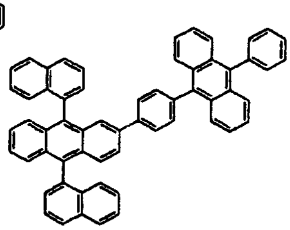
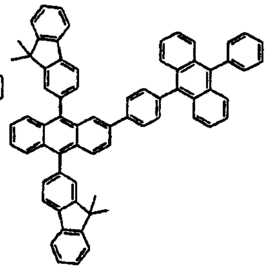
     

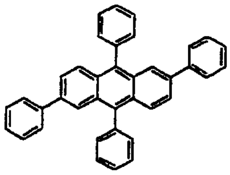
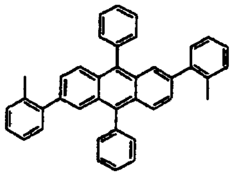
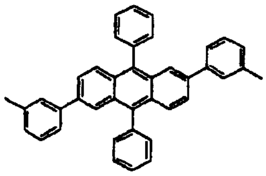
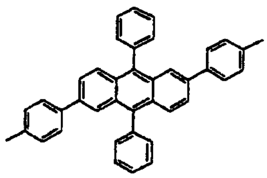
     

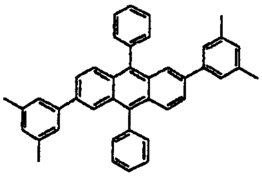
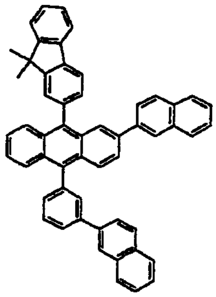
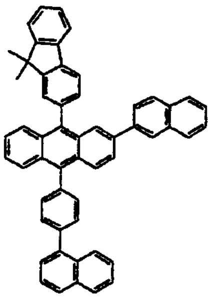
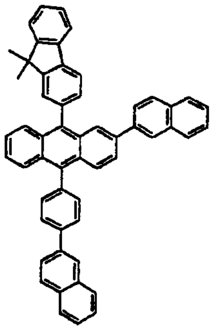
     

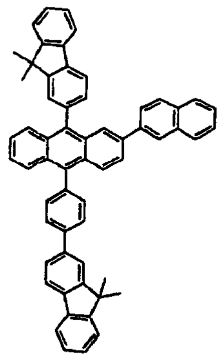
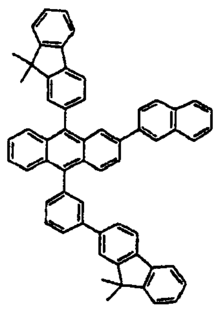
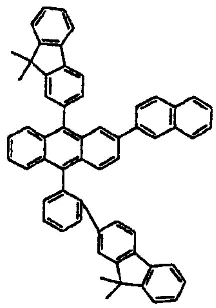
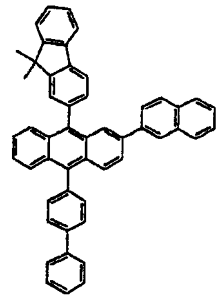
   

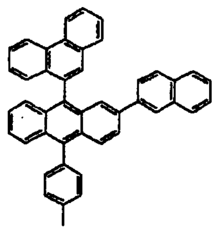
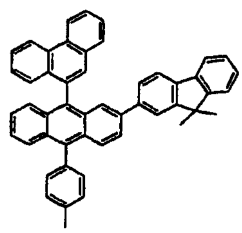
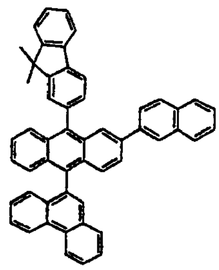
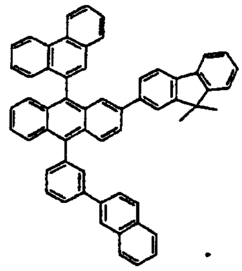





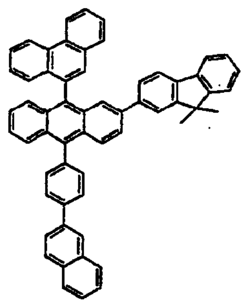
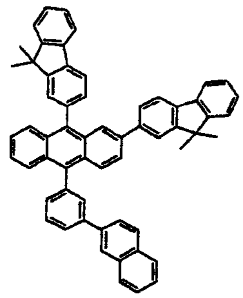
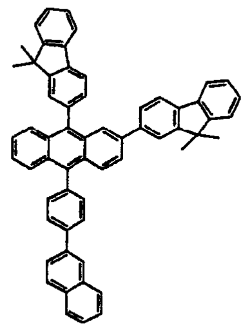
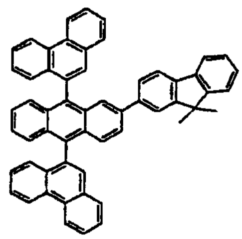





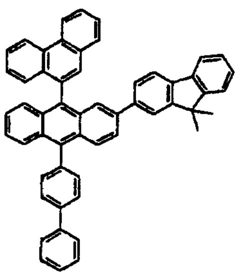
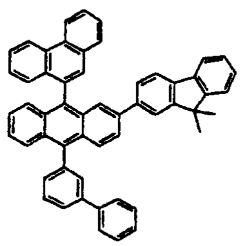
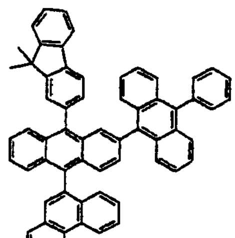
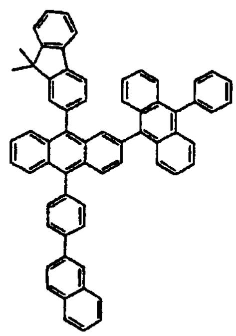





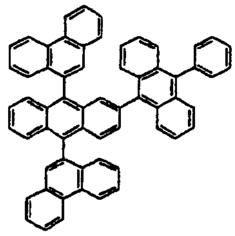
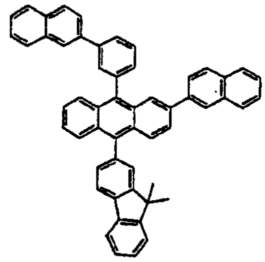
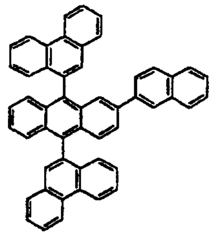





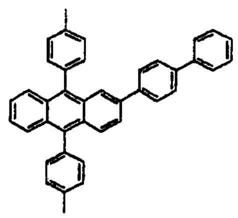
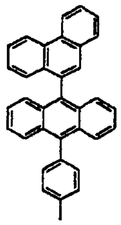
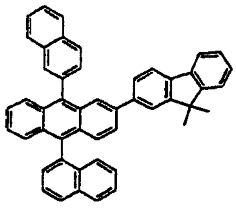





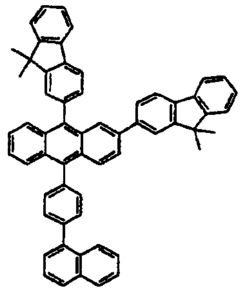
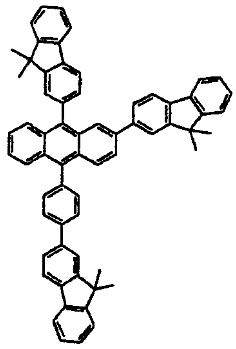
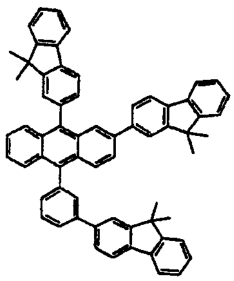
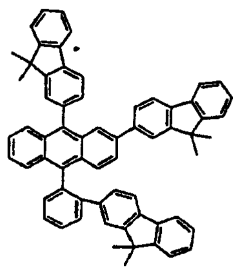





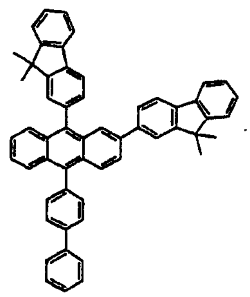
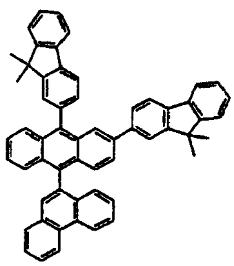
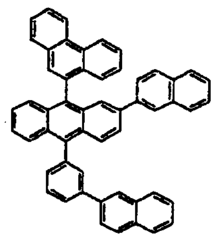
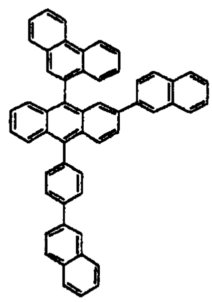





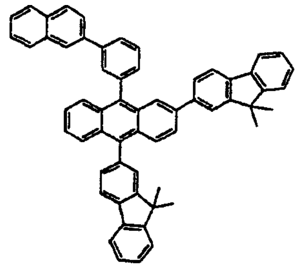
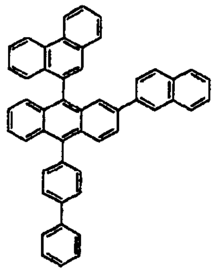
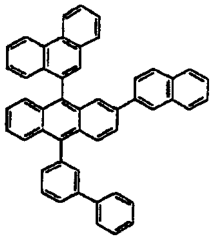
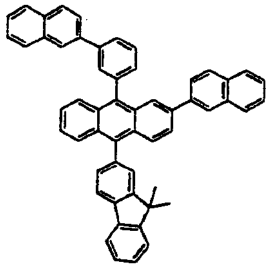





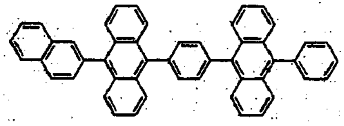
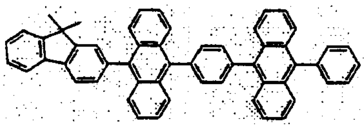




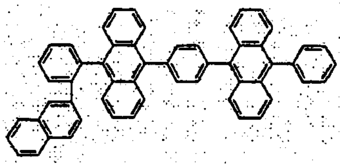
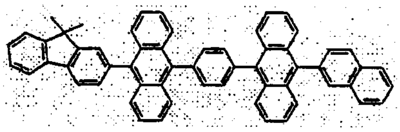




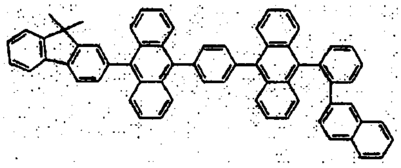
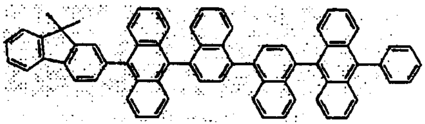





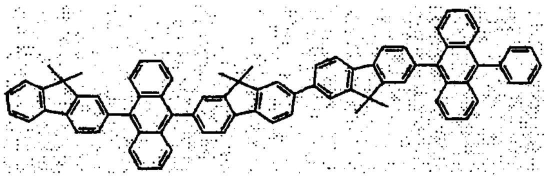
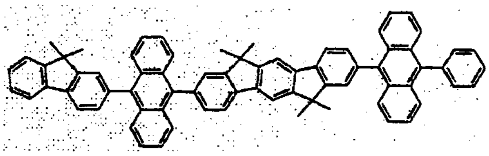





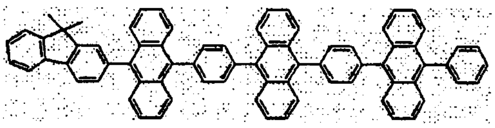
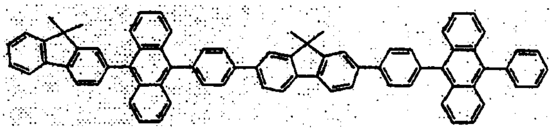





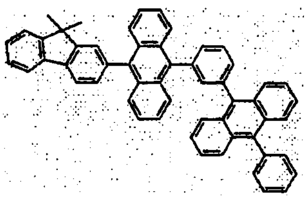
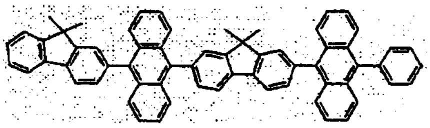



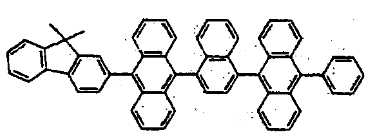
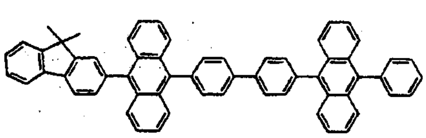



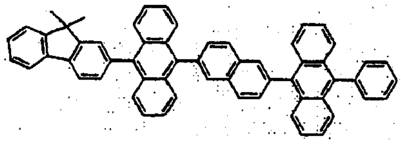
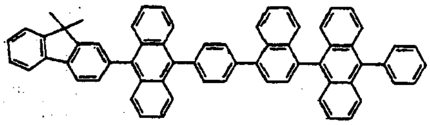



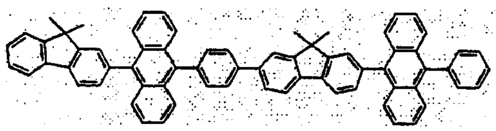
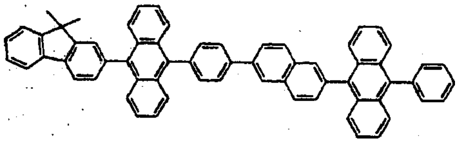



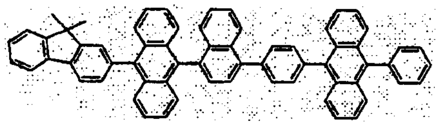
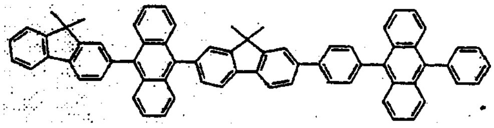



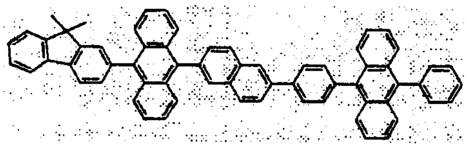
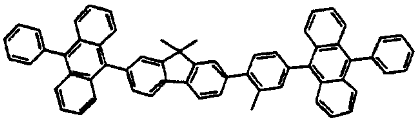



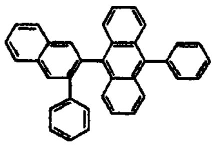
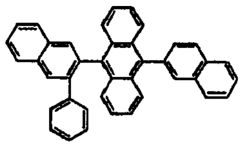
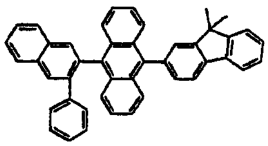
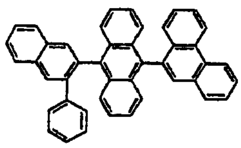
 

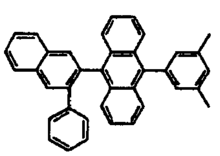
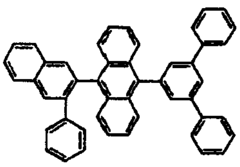
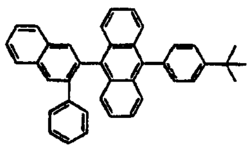
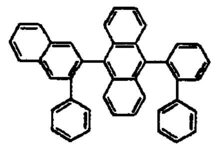
 

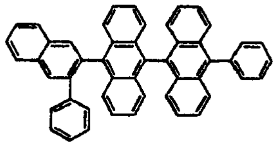
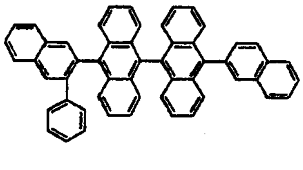
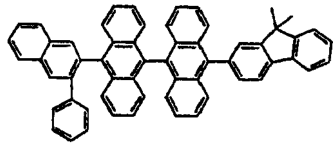
 

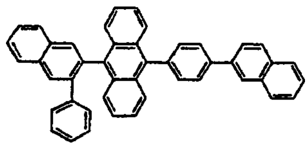
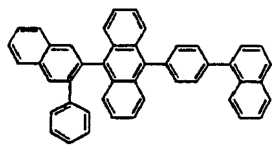
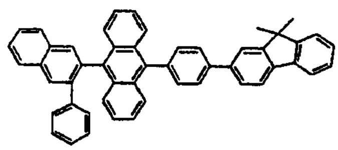
 

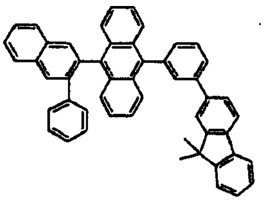
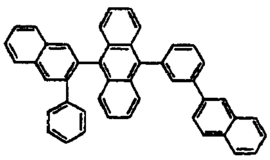
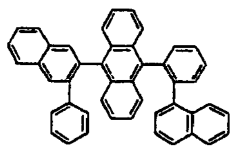
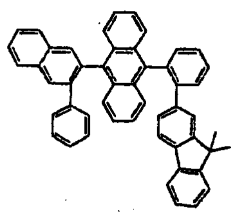
 

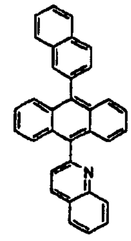
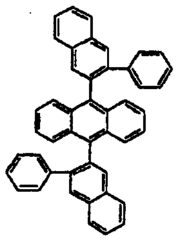
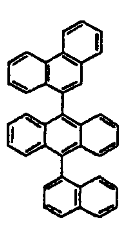
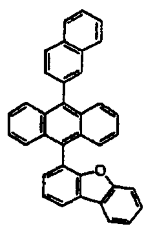
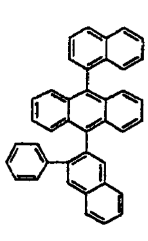
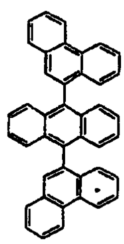
   

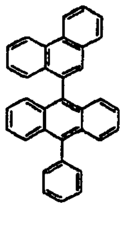
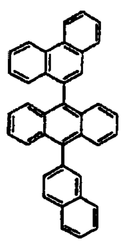
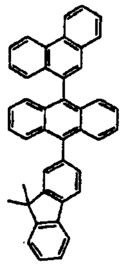
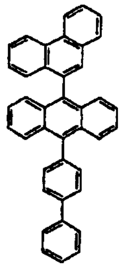
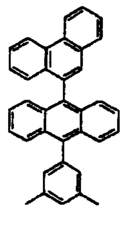
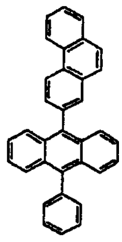
   

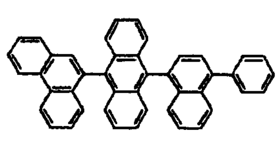
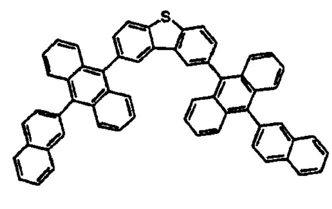
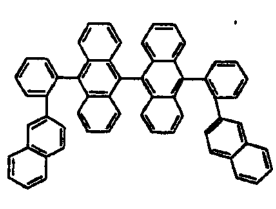
  

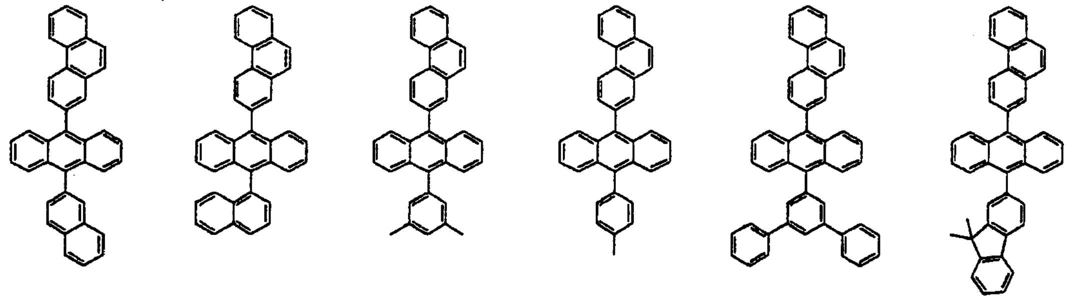




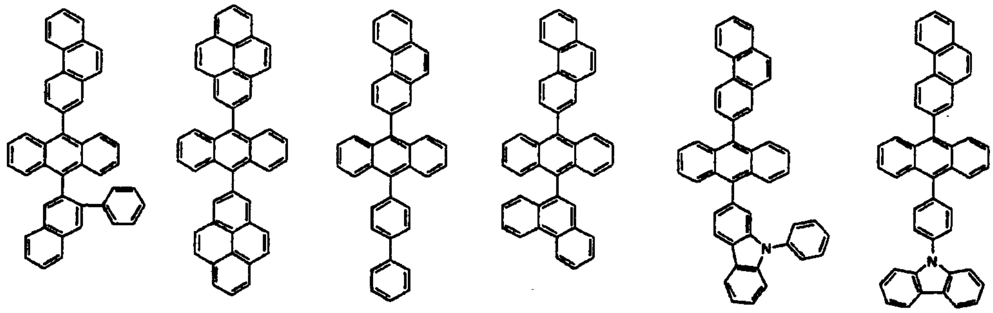









在根據本發明之有機電場發光裝置中，較佳為在電極對之至少一側的內表面上替代一層或多層選自硫屬元素化合物(chalcogenide)層、金屬鹵化物層以及金屬氧化物層的層(後文稱為“表面層”)。具體地，較佳為將矽與鋁金屬(包括氧化物)之硫屬元素化合物層安排在 EL 介質層之陽極表面上，以及將金屬鹵化物層或金屬氧化物層設置在 EL 介質層之陰極表面上。結果可獲得操作的穩定度。

硫屬元素化合物之例子較佳包括 SiO_x ($1 \leqq x \leqq 2$)、AlO_x ($1 \leqq x \leqq 5$)、SiON、SiAlON 等等。金屬鹵化物之例子較佳包括 LiF、MgF_2、CaF_2、鑭系元素之氟化物等等。金屬氧化物之例子較佳包括 Cs_2O、Li_2O、MgO、SrO、BaO、CaO 等等。

在根據本發明之有機電場發光裝置中，亦較佳為將電子傳輸化合物與還原性摻雜物之混合區域、或將電洞傳輸化合物與氧化性摻雜物之混合區域設置於前述所製造電極對之至少一表面上。因此，電子傳輸化合物被還原成陰離

子，以促使電子自混合區域注入及傳輸至 EL 介質。此外，由於電洞傳輸化合物被氧化成陽離子，促使電洞自混合區域注入及傳輸至 EL 介質。較佳的氧化性摻雜物包括各式路易士酸(Lewis acid)及接受者化合物(acceptor compound)。較佳的還原性摻雜物包括多種鹼金屬、鹼金屬化合物、鹼土金屬、稀土金屬及其混合物。

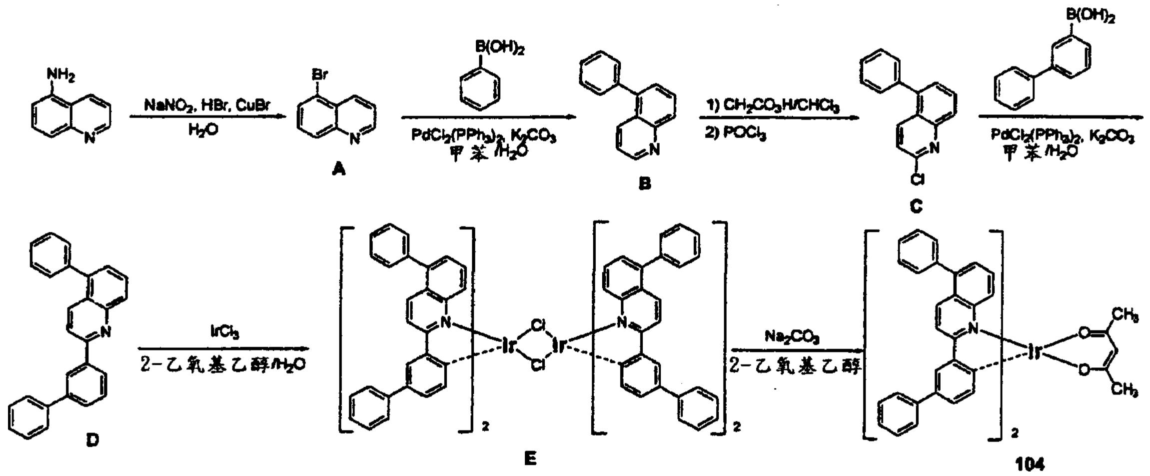
相較於習知磷光材料，根據本發明之有機電場發光化合物具有更優良的 EL 特性及熱穩定性之骨架，其相較於習知材料提供較高的量子效率及較低的操作電壓。因此，若將根據本發明之有機電場發光化合物應用於 OLED 面板，則在具有中型至大型尺寸之 OLED 之發展上可期預見其進一步加強的結果。若將化合物作為具有高效率之材料而應用於有機太陽能電池，則相較於習知材料可預見其更優良的特性。

最佳模式

本發明進一步經由參閱實施例而敘述關於用以製備根據本發明之新穎有機電場發場化合物之製程，該實施例僅作為例示用，並非意欲以任何形式限制本發明之範疇。

製備例

[製備例 1]化合物(104)之製備



<u>化合物(A)之製備</u>

將 5-胺基喹啉(20.0 公克(g)，138.7 毫莫耳(mmol))溶於氫溴酸(48% HBr 水溶液)(60 毫升(mL))中，並且將溶液冷卻至-10℃。添加入亞硝酸鈉水溶液(10.9g，158.1mmol)(溶於 100mL H_2O 中)。於 0℃攪拌 10 分鐘後，將溴化銅溶液(CuBr)(23.1g，160.9mL)(溶於 240 mL 之 H_2O 及 65 mL 之 HBr 水溶液中)添加入反應混合物中。將所產生之混合物攪拌且於 60℃加熱 30 分鐘。當反應完成後，將反應混合物冷卻至室溫，而且倒入冰水。在經由使用 NaOH(4M)水溶液將 pH 調整至約 10 後，以乙酸乙酯萃取混合物，並且在減壓下過濾。經由矽膠管柱層析法純化以得化合物(A)(18.2g，87.4mmol)。

<u>化合物(B)之製備</u>

將化合物(A)(18.0g，86.5mmol)、苯硼酸(12.7g，103.8mmol)以及肆(三苯基膦)鈀(0)($Pd(PPh_3)_4$)(3.6g，5.2 mmol)溶於甲苯(150mL)及乙醇(45mL)中。在添加入 2M 碳酸鈉水溶液(70mL)後，將所產生之混合物於迴流下在

120℃攪拌 4 小時。接著，將混合物冷卻至 25℃，並且添加蒸餾水(200 mL)來停止反應。以乙酸乙酯(300 mL)萃取所產生之混合物，並且將萃取物在減壓下乾燥。經由矽膠管柱層析法純化而得化合物(B)(14.6g，70.9 mmol)。

化合物(C)之製備

將化合物(B)(14.0g，68.2 mmol)溶於氯仿(200mL)中，並且將過氧乙酸(150mL)添加至溶液。將反應混合物於迴流下攪拌 4 小時。當反應完成後，將反應混合物冷卻至室溫，並且倒入冰水。藉由使用氫氧化鈉水溶液(10M)而將 pH 調整至約 10。接著，於減壓下獲得所產生之固體。將固體冷卻至 5℃，並且添加入 $POCl_3$(150mL)，以及將混合物於 100℃迴流下攪拌 1 小時。將溶液冷卻至室溫，並且添加入冰水。在經由使用氫氧化鈉水溶液(10M)將 pH 調整至約 8 後，以二氯甲烷萃取混合物，並且於減壓下過濾。經由矽膠管柱層析法純化而得化合物(C)(6.2 g，25.9 mmol)。

化合物(D)之製備

將化合物(C)(6.0 g，25.0 mmol)、3-聯苯硼酸(6.0 g，30.0 mmol)以及肆(三苯基膦)鈀(0)($Pd(PPh_3)_4$)(1.1 g，1.5 mmol)溶於甲苯(100 mL)及乙醇(30 mL)中。在添加入 2M 碳酸鈉水溶液(30 mL)後，將所產生之混合物於迴流下在 120℃攪拌 4 小時。接著，將混合物冷卻至 25℃，並且添加蒸餾水(200 mL)來停止反應。以乙酸乙酯(300 mL)萃取所產生之混合物，並且將萃取物在減壓下乾燥。經由矽膠管柱層析法純化而得化合物(D)(7.2 g，20.0 mmol)。

化合物(E)之製備

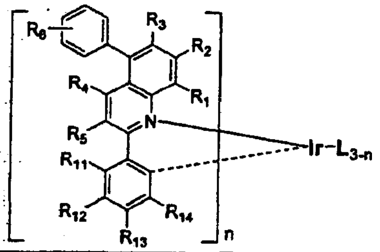
將化合物(D)(7.0g，19.6mmol)與氯化銥($IrCl_3$)(2.63g，8.82 mmol)溶於 2-乙氧基乙醇(80 mL)與蒸餾水(35mL)中，並且將溶液於迴流下攪拌 24 小時。當反應完成後，將反應混合物冷卻至室溫。接著，將所產生之固體過濾且乾燥而得化合物(E)(9.1g，7.79 mmol)。

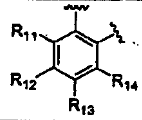
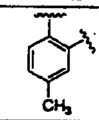
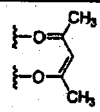
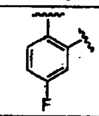
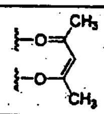
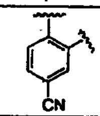
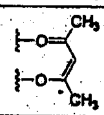
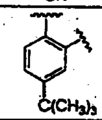
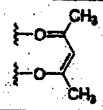
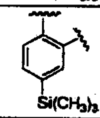
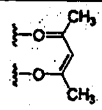
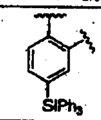
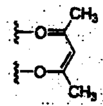
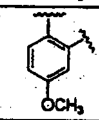
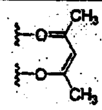
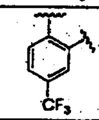
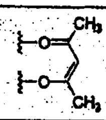
化合物(104)之製備

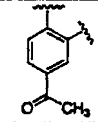
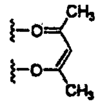
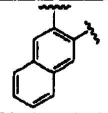
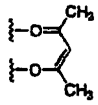
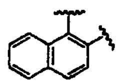
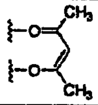
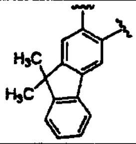
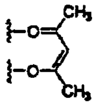
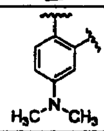
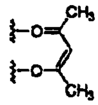
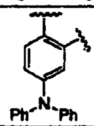
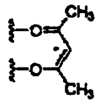
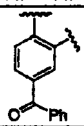
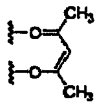
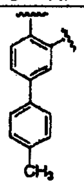
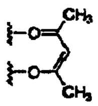
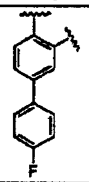
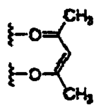
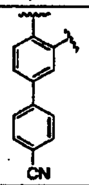
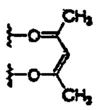
將化合物(E)(9.1 g，7.8 mmol)與 2,4-戊二酮(0.9 g，9.3 mmol)以及 Na_2CO_3(3.0g，28.0 mmol)溶於 2-乙氧基乙醇(240mL)中，並且將溶液加熱 4 小時。當反應完成後，將反應混合物冷卻至室溫，並且將所產生之固體沉澱物過濾。經由矽膠管柱層析法純化與重結晶而得呈紅色結晶之化合物(104)(0.8g，1.3mmol，整體產率：16%)。

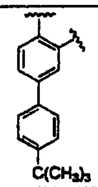
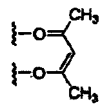
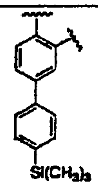
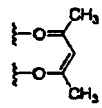
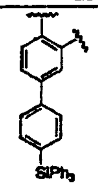
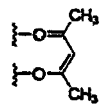
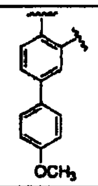
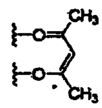
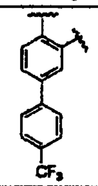
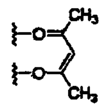
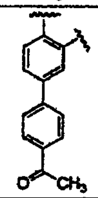
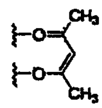
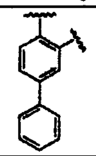
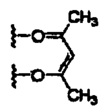
根據與製備例 1 相同的程序，製備表 1 中的有機電場發光化合物(化合物 1 至化合物 1019)，該等有機電場發光化合物之 ^{1}H NMR 及 MS/FAB 數據係記載於表 2 中。

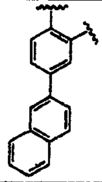
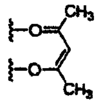
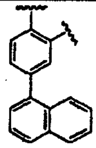
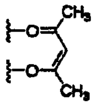
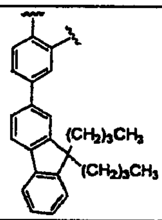
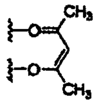
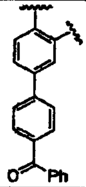
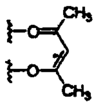
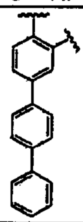
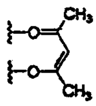
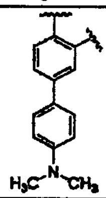
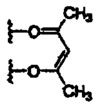
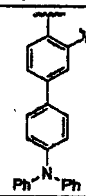
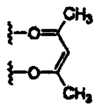
表 1

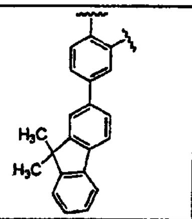
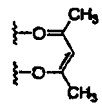
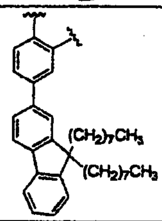
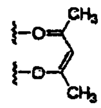
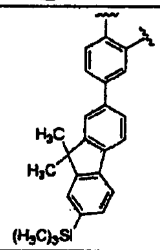
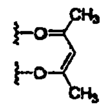
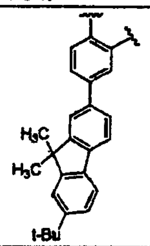
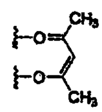
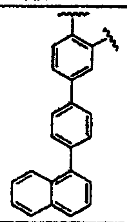
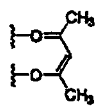
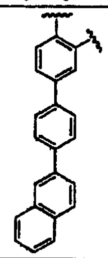
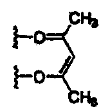


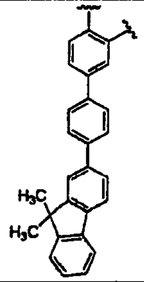
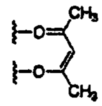
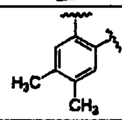
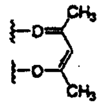
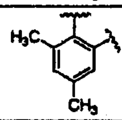
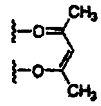
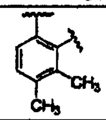
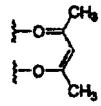
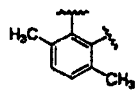
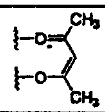
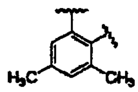
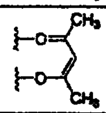
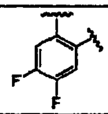
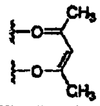
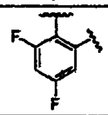
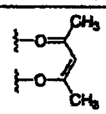
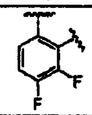
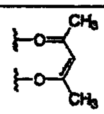
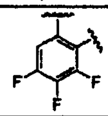
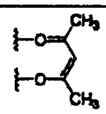
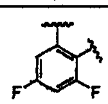
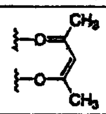
No.	R_1	R_2	R_3	R_4	R_5	R_6		L	n
1	H	H	H	H	H	H			2
2	H	H	H	H	H	H			2
3	H	H	H	H	H	H			2
4	H	H	H	H	H	H			2
5	H	H	H	H	H	H			2
6	H	H	H	H	H	H			2
7	H	H	H	H	H	H			2
8	H	H	H	H	H	H			2

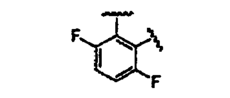
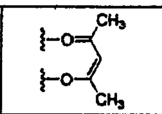
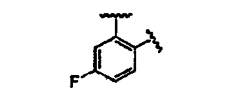
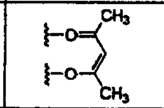
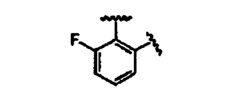
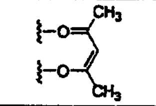
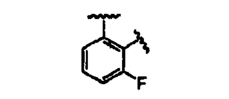
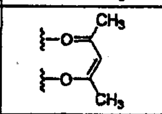
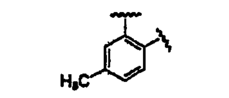
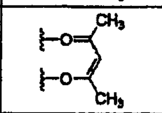
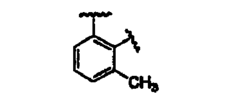
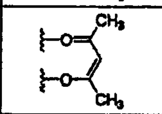
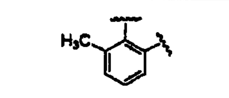
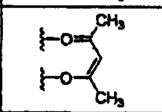
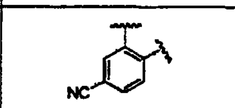
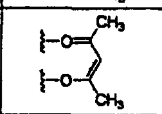
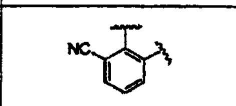
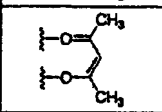
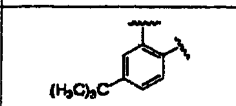
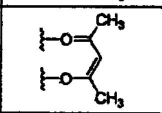
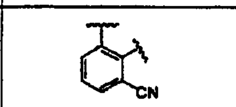
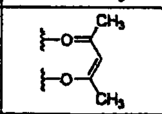
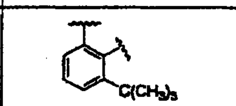
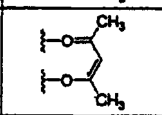
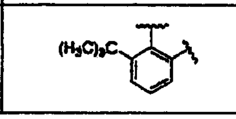
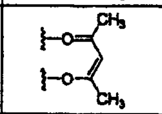
9	H	H	H	H	H	H			2
10	H	H	H	H	H	H			2
11	H	H	H	H	H	H			2
12	H	H	H	H	H	H			2
13	H	H	H	H	H	H			2
14	H	H	H	H	H	H			2
15	H	H	H	H	H	H			2
16	H	H	H	H	H	H			2
17	H	H	H	H	H	H			2
18	H	H	H	H	H	H			2

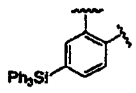
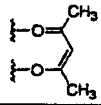
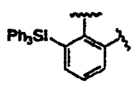
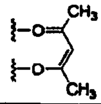
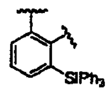
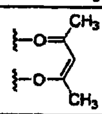
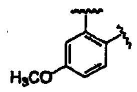
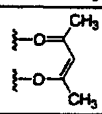
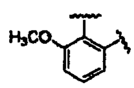
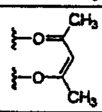
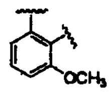
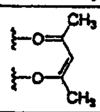
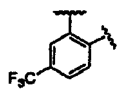
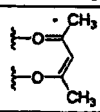
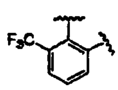
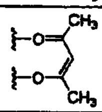
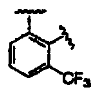
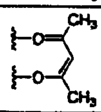
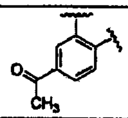
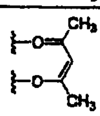
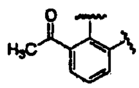
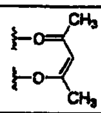
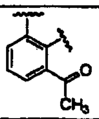
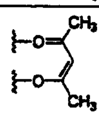
19	H	H	H	H	H	H			2
20	H	H	H	H	H	H			2
21	H	H	H	H	H	H			2
22	H	H	H	H	H	H			2
23	H	H	H	H	H	H			2
24	H	H	H	H	H	H			2
25	H	H	H	H	H	H			2

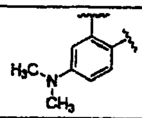
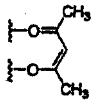
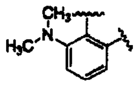
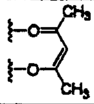
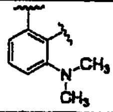
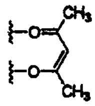
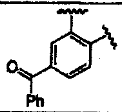
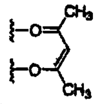
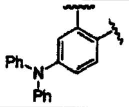
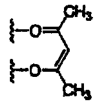
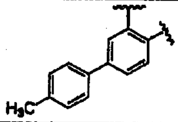
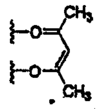
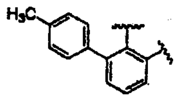
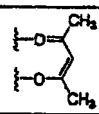
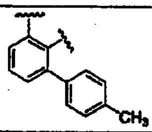
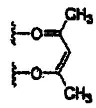
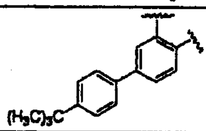
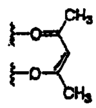
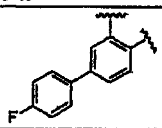
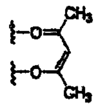
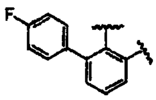
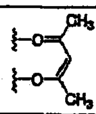
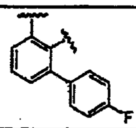
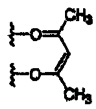
26	H	H	H	H	H	H			2
27	H	H	H	H	H	H			2
28	H	H	H	H	H	H			2
29	H	H	H	H	H	H			2
30	H	H	H	H	H	H			2
31	H	H	H	H	H	H			2
32	H	H	H	H	H	H			2

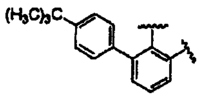
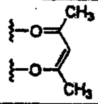
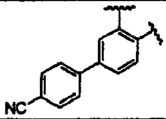
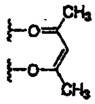
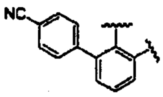
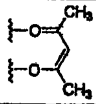
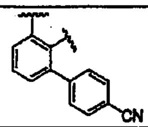
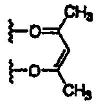
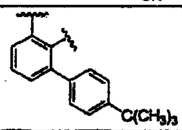
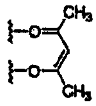
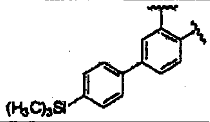
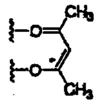
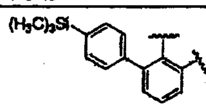
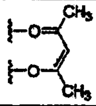
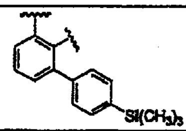
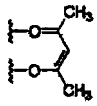
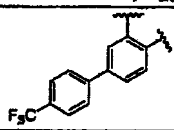
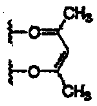
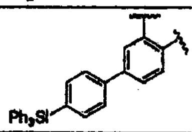
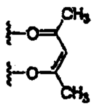
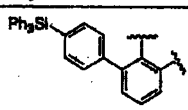
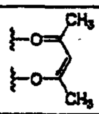
33	H	H	H	H	H	H			2
34	H	H	H	H	H	H			2
35	H	H	H	H	H	H			2
36	H	H	H	H	H	H			2
37	H	H	H	H	H	H			2
38	H	H	H	H	H	H			2

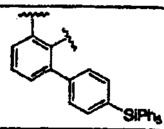
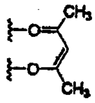
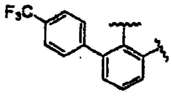
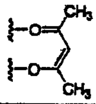
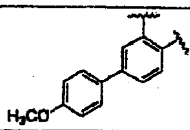
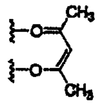
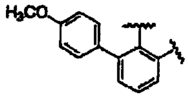
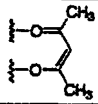
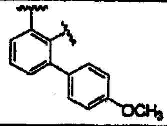
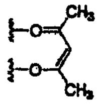
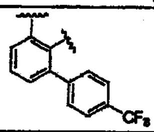
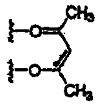
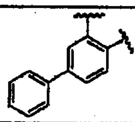
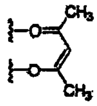
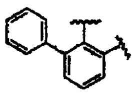
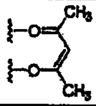
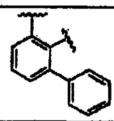
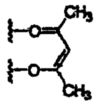
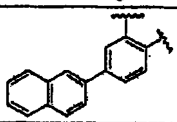
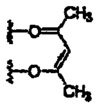
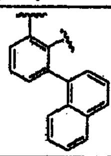
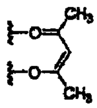
39	H	H	H	H	H	H			2
40	H	H	H	H	H	H			2
41	H	H	H	H	H	H			2
42	H	H	H	H	H	H			2
43	H	H	H	H	H	H			2
44	H	H	H	H	H	H			2
45	H	H	H	H	H	H			2
46	H	H	H	H	H	H			2
47	H	H	H	H	H	H			2
48	H	H	H	H	H	H			2
49	H	H	H	H	H	H			2

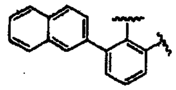
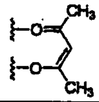
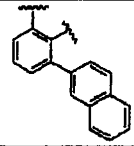
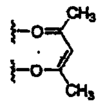
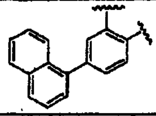
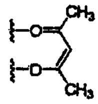
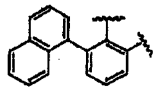
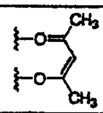
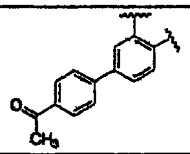
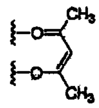
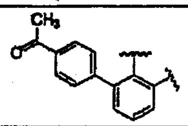
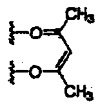
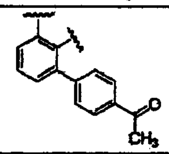
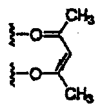
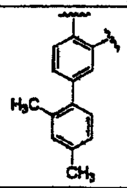
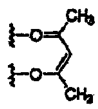
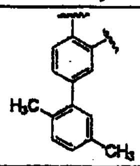
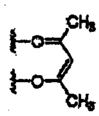
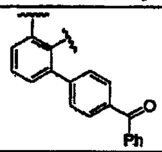
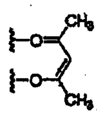
50	H	H	H	H	H	H			2
51	H	H	H	H	H	H			2
52	H	H	H	H	H	H			2
53	H	H	H	H	H	H			2
54	H	H	H	H	H	H			2
55	H	H	H	H	H	H			2
56	H	H	H	H	H	H			2
57	H	H	H	H	H	H			2
58	H	H	H	H	H	H			2
59	H	H	H	H	H	H			2
60	H	H	H	H	H	H			2
61	H	H	H	H	H	H			2
62	H	H	H	H	H	H			2

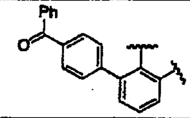
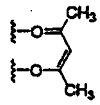
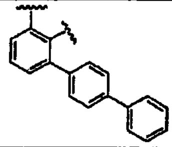
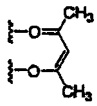
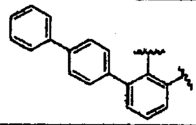
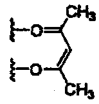
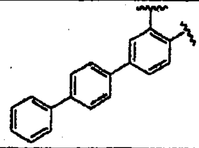
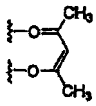
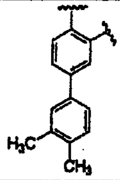
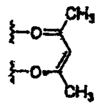
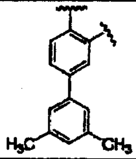
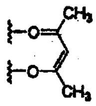
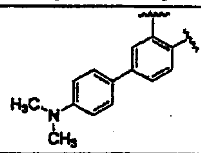
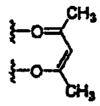
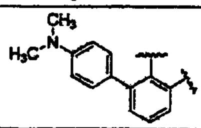
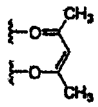
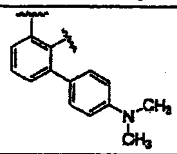
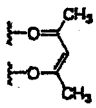
63	H	H	H	H	H	H			2
64	H	H	H	H	H	H			2
65	H	H	H	H	H	H			2
66	H	H	H	H	H	H			2
67	H	H	H	H	H	H			2
68	H	H	H	H	H	H			2
69	H	H	H	H	H	H			2
70	H	H	H	H	H	H			2
71	H	H	H	H	H	H			2
72	H	H	H	H	H	H			2
73	H	H	H	H	H	H			2
74	H	H	H	H	H	H			2

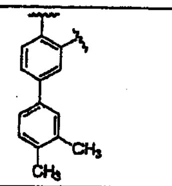
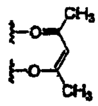
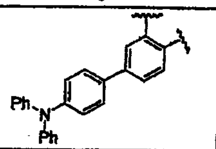
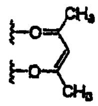
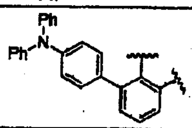
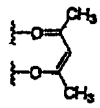
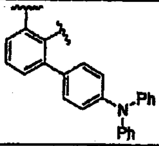
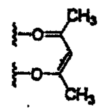
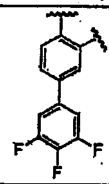
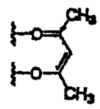
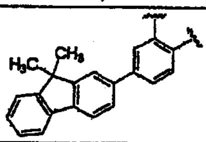
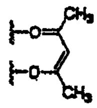
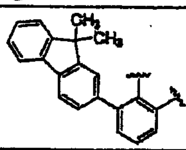
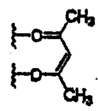
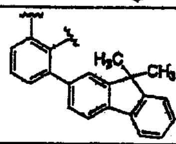
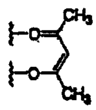
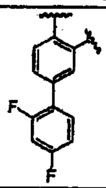
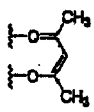
75	H	H	H	H	H	H			2
76	H	H	H	H	H	H			2
77	H	H	H	H	H	H			2
78	H	H	H	H	H	H			2
79	H	H	H	H	H	H			2
80	H	H	H	H	H	H			2
81	H	H	H	H	H	H			2
82	H	H	H	H	H	H			2
83	H	H	H	H	H	H			2
84	H	H	H	H	H	H			2
85	H	H	H	H	H	H			2
86	H	H	H	H	H	H			2

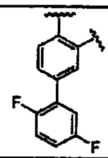
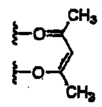
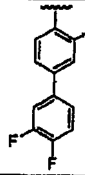
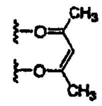
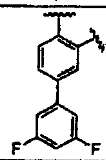
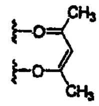
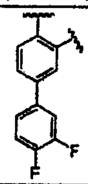
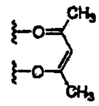
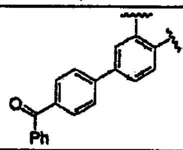
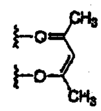
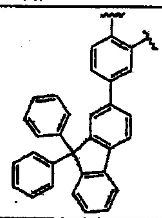
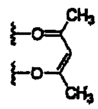
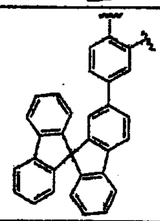
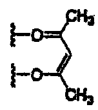
87	H	H	H	H	H	H			2
88	H	H	H	H	H	H			2
89	H	H	H	H	H	H			2
90	H	H	H	H	H	H			2
91	H	H	H	H	H	H			2
92	H	H	H	H	H	H			2
93	H	H	H	H	H	H			2
94	H	H	H	H	H	H			2
95	H	H	H	H	H	H			2
96	H	H	H	H	H	H			2
97	H	H	H	H	H	H			2

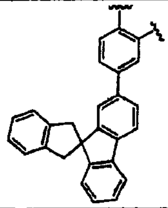
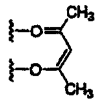
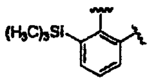
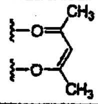
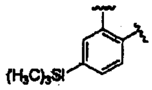
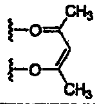
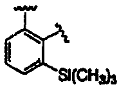
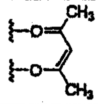
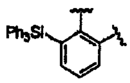
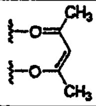
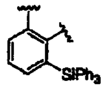
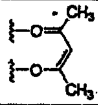
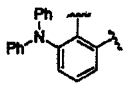
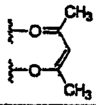
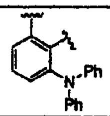
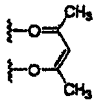
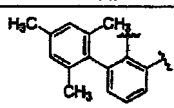
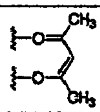
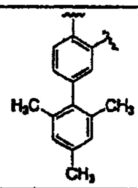
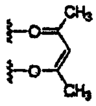
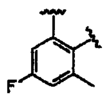
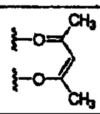
98	H	H	H	H	H	H			2
99	H	H	H	H	H	H			2
100	H	H	H	H	H	H			2
101	H	H	H	H	H	H			2
102	H	H	H	H	H	H			2
103	H	H	H	H	H	H			2
104	H	H	H	H	H	H			2
105	H	H	H	H	H	H			2
106	H	H	H	H	H	H			2
107	H	H	H	H	H	H			2
108	H	H	H	H	H	H			2

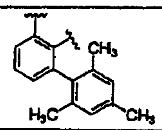
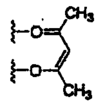
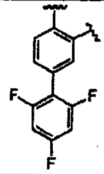
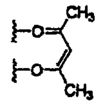
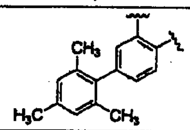
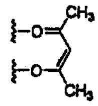
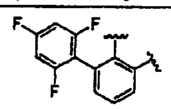
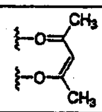
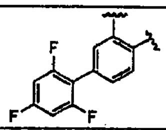
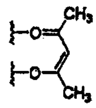
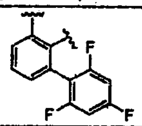
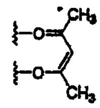
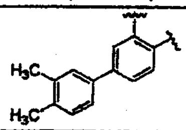
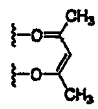
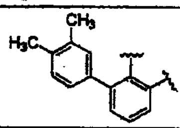
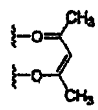
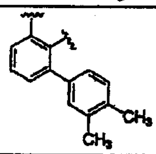
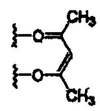
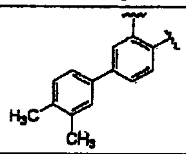
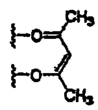
109	H	H	H	H	H	H			2
110	H	H	H	H	H	H			2
111	H	H	H	H	H	H			2
112	H	H	H	H	H	H			2
113	H	H	H	H	H	H			2
114	H	H	H	H	H	H			2
115	H	H	H	H	H	H			2
116	H	H	H	H	H	H			2
117	H	H	H	H	H	H			2
118	H	H	H	H	H	H			2

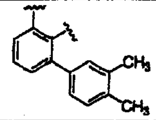
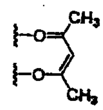
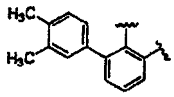
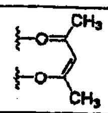
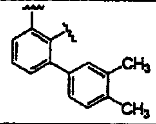
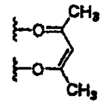
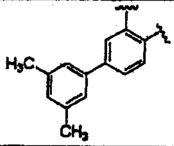
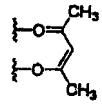
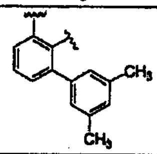
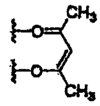
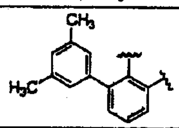
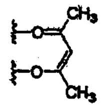
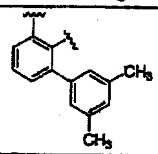
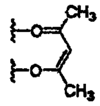
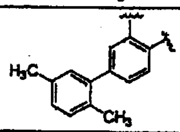
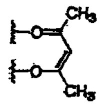
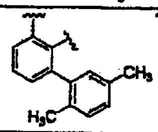
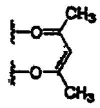
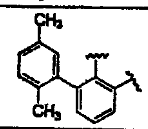
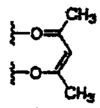
119	H	H	H	H	H	H			2
120	H	H	H	H	H	H			2
121	H	H	H	H	H	H			2
122	H	H	H	H	H	H			2
123	H	H	H	H	H	H			2
124	H	H	H	H	H	H			2
125	H	H	H	H	H	H			2
126	H	H	H	H	H	H			2
127	H	H	H	H	H	H			2

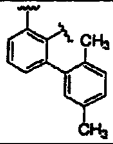
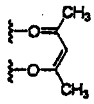
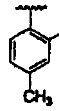
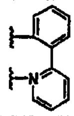
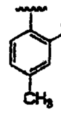
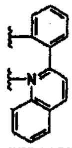
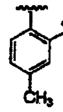
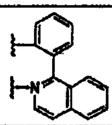
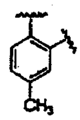
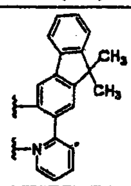
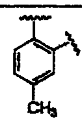
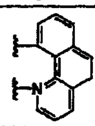
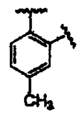
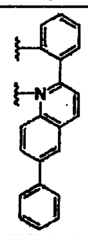
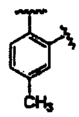
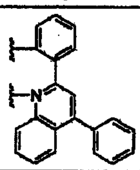
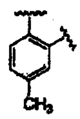
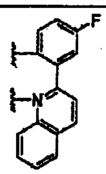
128	H	H	H	H	H	H			2
129	H	H	H	H	H	H			2
130	H	H	H	H	H	H			2
131	H	H	H	H	H	H			2
132	H	H	H	H	H	H			2
133	H	H	H	H	H	H			2
134	H	H	H	H	H	H			2
135	H	H	H	H	H	H			2
136	H	H	H	H	H	H			2

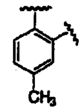
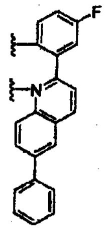
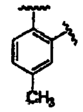
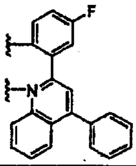
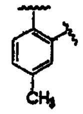
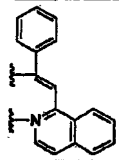
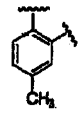
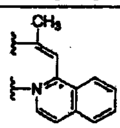
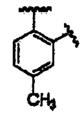
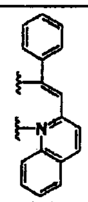
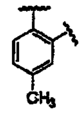
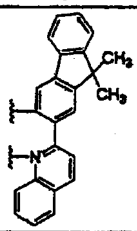
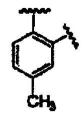
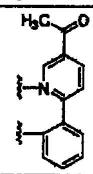
137	H	H	H	H	H	H			2
138	H	H	H	H	H	H			2
139	H	H	H	H	H	H			2
40	H	H	H	H	H	H			2
141	H	H	H	H	H	H			2
142	H	H	H	H	H	H			2
143	H	H	H	H	H	H			2

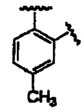
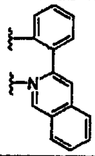
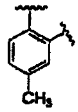
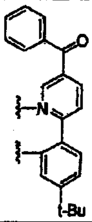
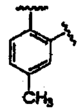
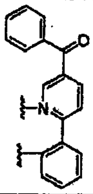
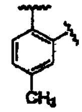
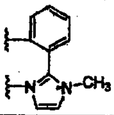
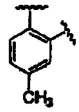
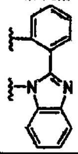
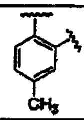
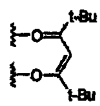
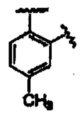
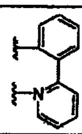
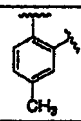
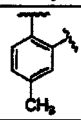
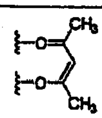
144	H	H	H	H	H	H			2
145	H	H	H	H	H	H			2
146	H	H	H	H	H	H			2
147	H	H	H	H	H	H			2
148	H	H	H	H	H	H			2
149	H	H	H	H	H	H			2
150	H	H	H	H	H	H			2
151	H	H	H	H	H	H			2
152	H	H	H	H	H	H			2
153	H	H	H	H	H	H			2
154	H	H	H	H	H	H			2

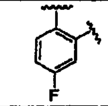
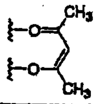
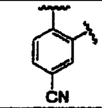
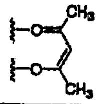
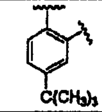
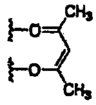
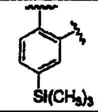
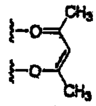
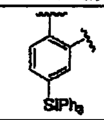
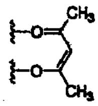
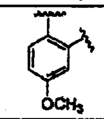
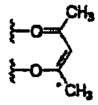
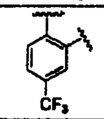
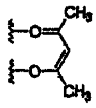
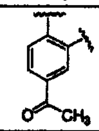
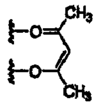
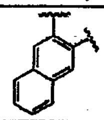
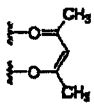
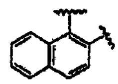
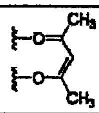
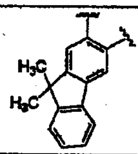
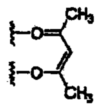
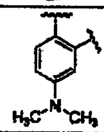
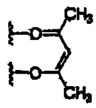
155	H	H	H	H	H	H			2
156	H	H	H	H	H	H			2
157	H	H	H	H	H	H			2
158	H	H	H	H	H	H			2
159	H	H	H	H	H	H			2
160	H	H	H	H	H	H			2
161	H	H	H	H	H	H			2
162	H	H	H	H	H	H			2
163	H	H	H	H	H	H			2
164	H	H	H	H	H	H			2

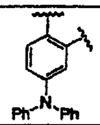
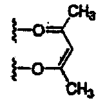
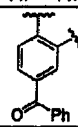
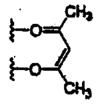
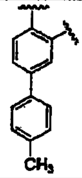
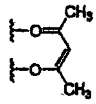
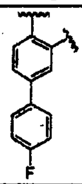
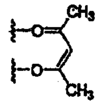
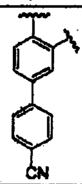
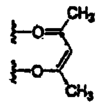
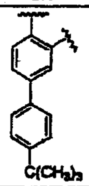
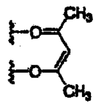
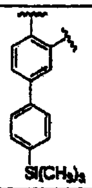
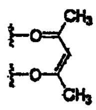
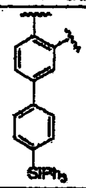
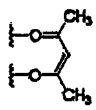
165	H	H	H	H	H	H			2
166	H	H	H	H	H	H			2
167	H	H	H	H	H	H			2
168	H	H	H	H	H	H			2
169	H	H	H	H	H	H			2
170	H	H	H	H	H	H			2
171	H	H	H	H	H	H			2
172	H	H	H	H	H	H			2
173	H	H	H	H	H	H			2
174	H	H	H	H	H	H			2

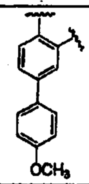
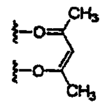
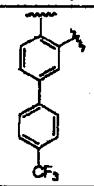
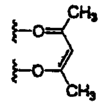
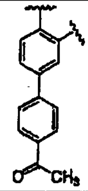
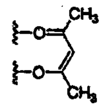
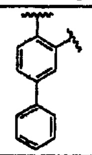
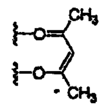
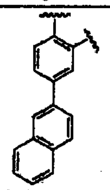
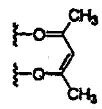
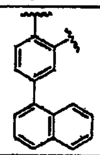
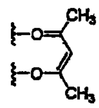
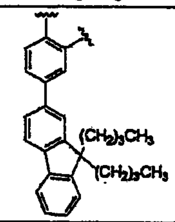
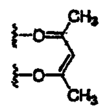
175	H	H	H	H	H	H			2
176	H	H	H	H	H	H			2
177	H	H	H	H	H	H			2
178	H	H	H	H	H	H			2
179	H	H	H	H	H	H			2
180	H	H	H	H	H	H			2
181	H	H	H	H	H	H			2
182	H	H	H	H	H	H			2
183	H	H	H	H	H	H			2

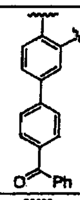
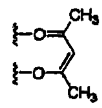
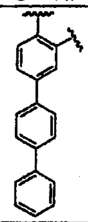
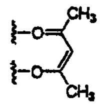
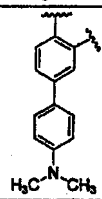
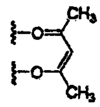
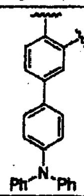
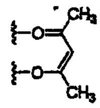
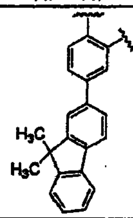
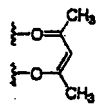
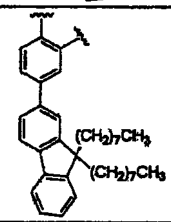
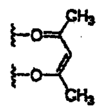
184	H	H	H	H	H	H			2
185	H	H	H	H	H	H			2
186	H	H	H	H	H	H			2
187	H	H	H	H	H	H			2
188	H	H	H	H	H	H			2
189	H	H	H	H	H	H			2
190	H	H	H	H	H	H			2

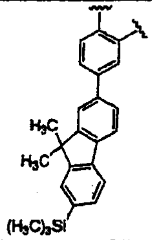
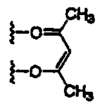
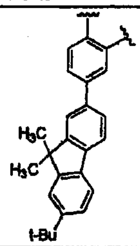
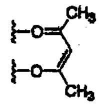
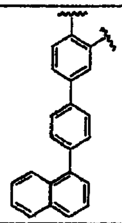
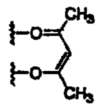
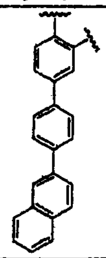
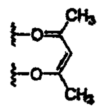
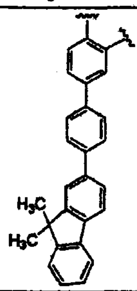
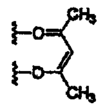
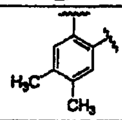
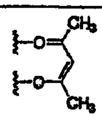
191	H	H	H	H	H	H			2
192	H	H	H	H	H	H			2
193	H	H	H	H	H	H			2
194	H	H	H	H	H	H			2
195	H	H	H	H	H	H			2
196	H	H	H	H	H	H			2
197	H	H	H	H	H	H			1
198	H	H	H	H	H	H		–	3
199	H	H	H	H	H	F			2

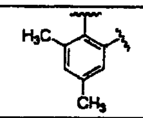
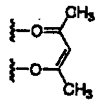
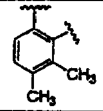
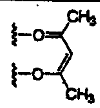
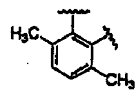
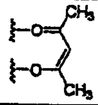
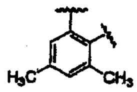
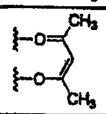
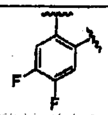
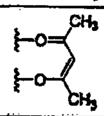
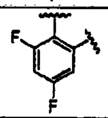
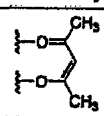
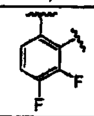
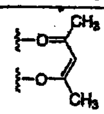
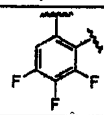
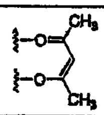
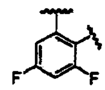
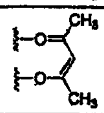
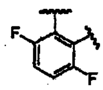
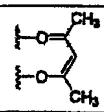
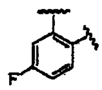
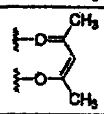
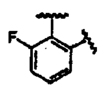
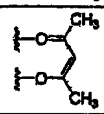
200	H	H	H	H	H	F			2
201	H	H	H	H	H	F			2
202	H	H	H	H	H	F			2
203	H	H	H	H	H	F			2
204	H	H	H	H	H	F			2
205	H	H	H	H	H	F			2
206	H	H	H	H	H	F			2
207	H	H	H	H	H	F			2
208	H	H	H	H	H	F			2
209	H	H	H	H	H	F			2
210	H	H	H	H	H	F			2
211	H	H	H	H	H	F			2

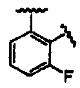
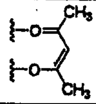
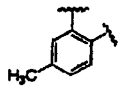
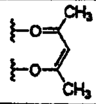
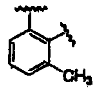
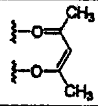
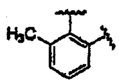
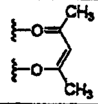
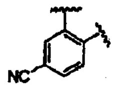
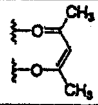
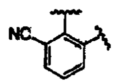
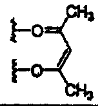
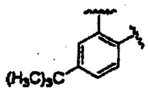
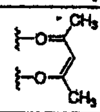
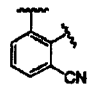
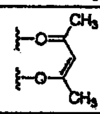
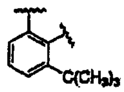
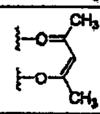
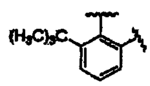
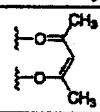
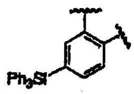
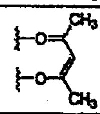
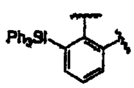
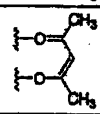
212	H	H	H	H	H	F			2
213	H	H	H	H	H	F			2
214	H	H	H	H	H	F			2
215	H	H	H	H	H	F			2
216	H	H	H	H	H	F			2
217	H	H	H	H	H	F			2
218	H	H	H	H	H	F			2
219	H	H	H	H	H	F			2

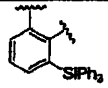
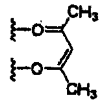
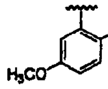
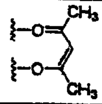
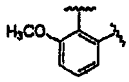
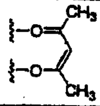
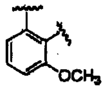
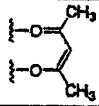
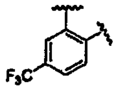
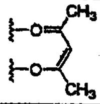
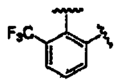
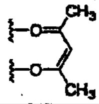
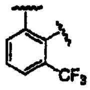
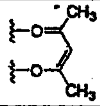
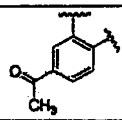
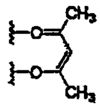
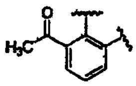
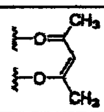
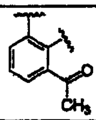
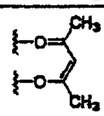
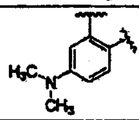
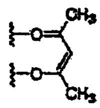
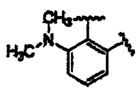
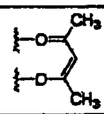
220	H	H	H	H	H	F			2
221	H	H	H	H	H	F			2
222	H	H	H	H	H	F			2
223	H	H	H	H	H	F			2
224	H	H	H	H	H	F			2
225	H	H	H	H	H	F			2
226	H	H	H	H	H	F			2

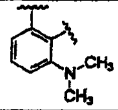
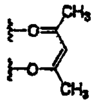
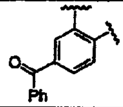
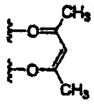
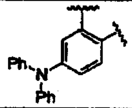
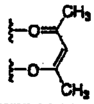
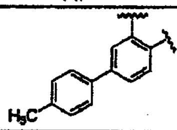
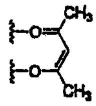
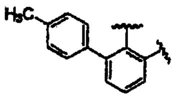
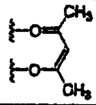
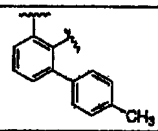
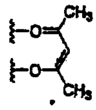
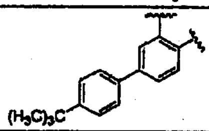
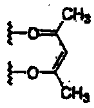
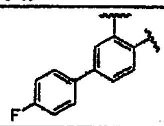
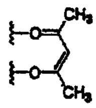
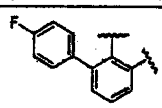
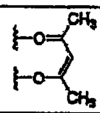
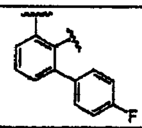
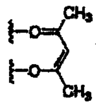
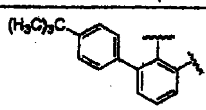
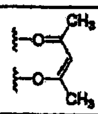
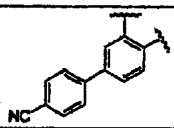
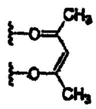
227	H	H	H	H	H	F			2
228	H	H	H	H	H	F			2
229	H	H	H	H	H	F			2
230	H	H	H	H	H	F			2
231	H	H	H	H	H	F			2
232	H	H	H	H	H	F			2

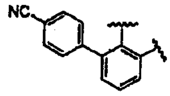
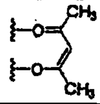
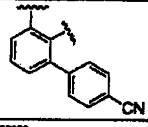
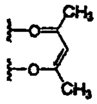
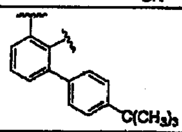
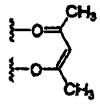
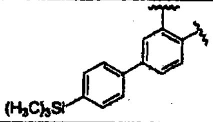
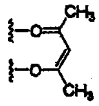
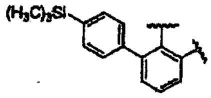
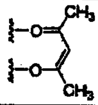
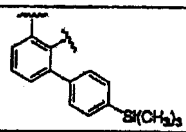
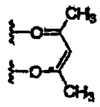
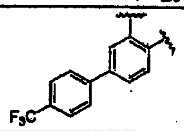
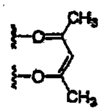
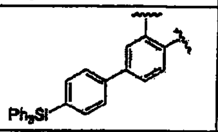
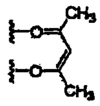
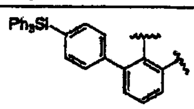
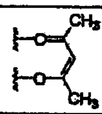
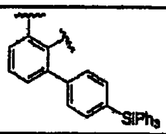
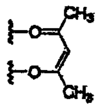
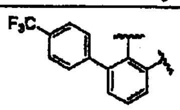
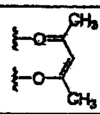
233	H	H	H	H	H	F			2
234	H	H	H	H	H	F			2
235	H	H	H	H	H	F			2
236	H	H	H	H	H	F			2
237	H	H	H	H	H	F			2
238	H	H	H	H	H	F			2

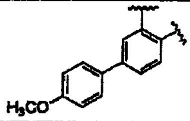
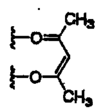
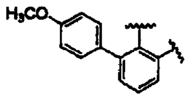
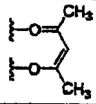
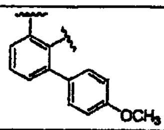
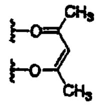
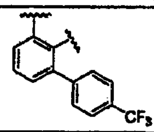
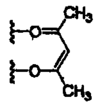
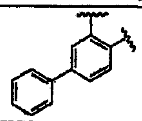
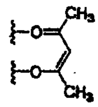
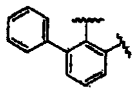
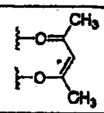
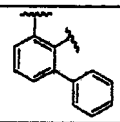
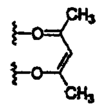
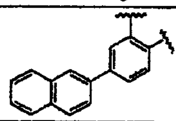
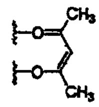
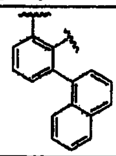
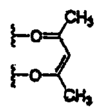
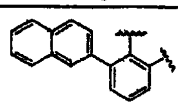
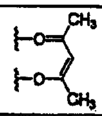
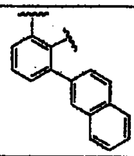
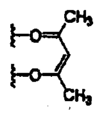
239	H	H	. H	H	H	F			2
240	H	H	H	H	H	F			2
241	H	H	H	H	H	F			2
242	H	H	H	H	H	F			2
243	H	H	H	H	H	F			2
244	H	H	H	H	H	F			2
245	H	H	H	H	H	F			2
246	H	H	H	H	H	F			2
247	H	H	H	H	H	F			2
248	H	H	H	H	H	F			2
249	H	H	H	H	H	F			2
250	H	H	H	H	H	F			2

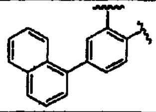
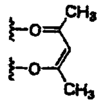
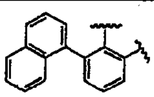
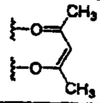
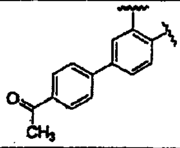
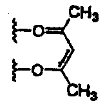
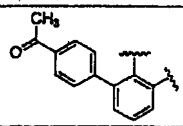
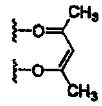
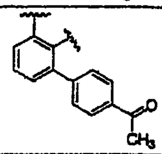
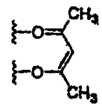
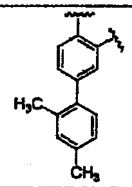
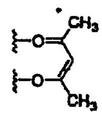
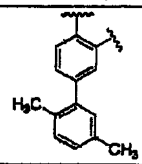
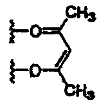
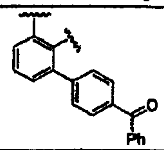
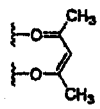
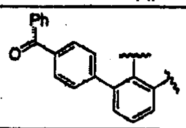
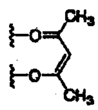
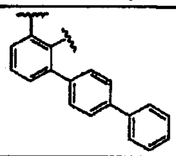
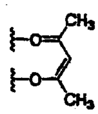
251	H	H	H	H	H	F			2
252	H	H	H	H	H	F			2
253	H	H	H	H	H	F			2
254	H	H	H	H	H	F			2
255	H	H	H	H	H	F			2
256	H	H	H	H	H	F			2
257	H	H	H	H	H	F			2
258	H	H	H	H	H	F			2
259	H	H	H	H	H	F			2
260	H	H	H	H	H	F			2
261	H	H	H	H	H	F			2
262	H	H	H	H	H	F			2

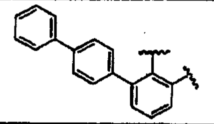
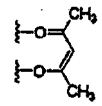
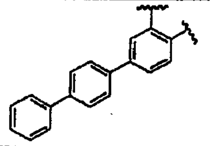
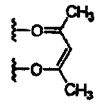
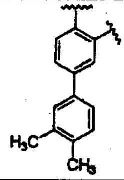
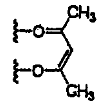
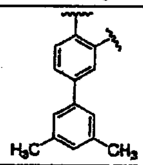
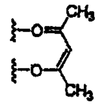
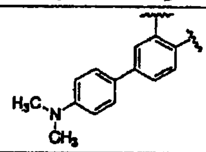
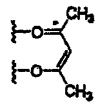
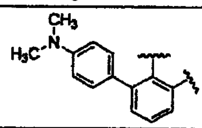
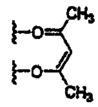
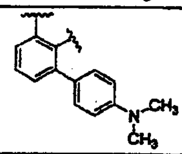
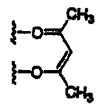
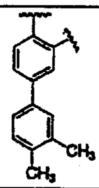
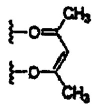
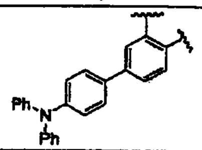
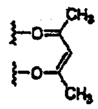
263	H	H	H	H	H	F			2
264	H	H	H	H	H	F			2
265	H	H	H	H	H	F			2
266	H	H	H	H	H	F			2
267	H	H	H	H	H	F			2
268	H	H	H	H	H	F			2
269	H	H	H	H	H	F			2
270	H	H	H	H	H	F			2
271	H	H	H	H	H	F			2
272	H	H	H	H	H	F			2
273	H	H	H	H	H	F			2
274	H	H	H	H	H	F			2

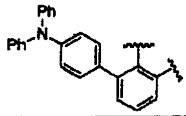
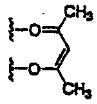
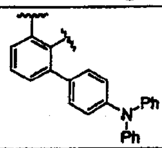
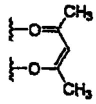
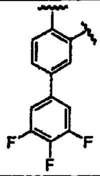
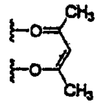
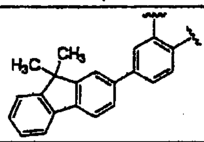
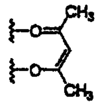
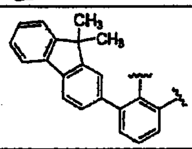
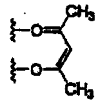
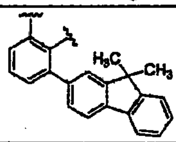
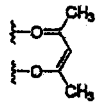
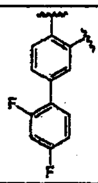
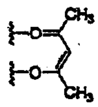
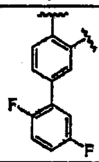
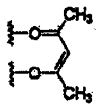
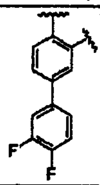
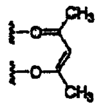
275	H	H	H	H	H	F			2
276	H	H	H	H	H	F			2
277	H	H	H	H	H	F			2
278	H	H	H	H	H	F			2
279	H	H	H	H	H	F			2
280	H	H	H	H	H	F			2
281	H	H	H	H	H	F			2
282	H	H	H	H	H	F			2
283	H	H	H	H	H	F			2
284	H	H	H	H	H	F			2
285	H	H	H	H	H	F			2
286	H	H	H	H	H	F			2

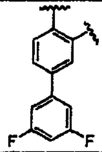
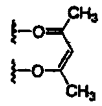
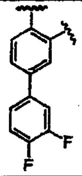
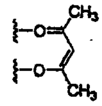
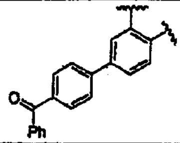
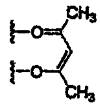
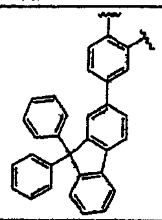
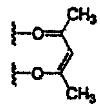
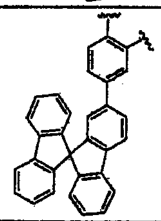
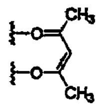
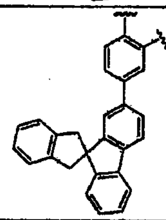
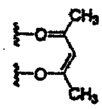
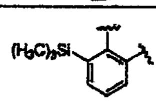
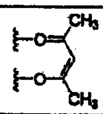
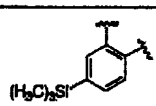
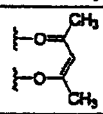
287	H	H	H	H	H	F			2
288	H	H	H	H	H	F			2
289	H	H	H	H	H	F			2
290	H	H	H	H	H	F			2
291	H	H	H	H	H	F			2
292	H	H	H	H	H	F			2
293	H	H	H	H	H	F			2
294	H	H	H	H	H	F			2
295	H	H	H	H	H	F			2
296	H	H	H	H	H	F			2
297	H	H	H	H	H	F			2

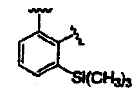
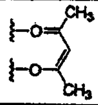
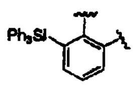
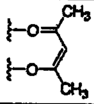
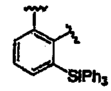
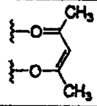
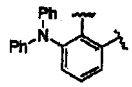
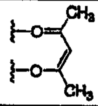
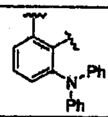
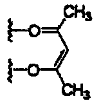
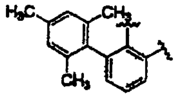
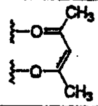
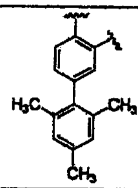
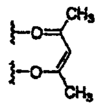
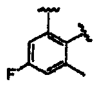
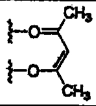
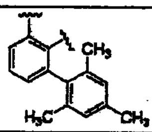
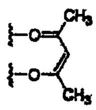
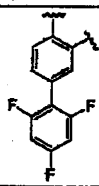
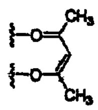
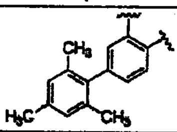
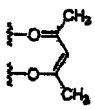
298	H	H	H	H	H	F			2
299	H	H	H	H	H	F			2
300	H	H	H	H	H	F			2
301	H	H	H	H	H	F			2
302	H	H	H	H	H	F			2
303	H	H	H	H	H	F			2
304	H	H	H	H	H	F			2
305	H	H	H	H	H	F			2
306	H	H	H	H	H	F			2
307	H	H	H	H	H	F			2
308	H	H	H	H	H	F			2

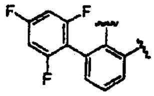
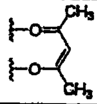
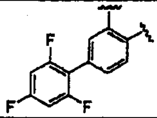
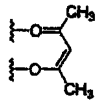
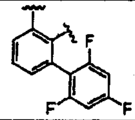
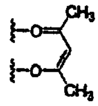
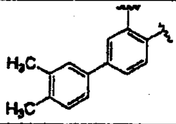
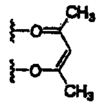
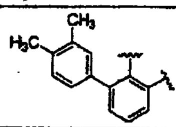
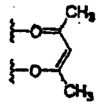
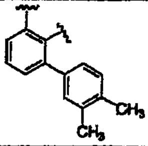
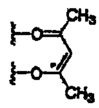
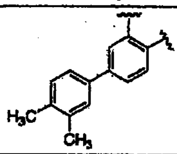
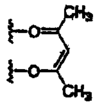
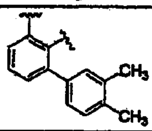
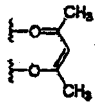
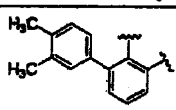
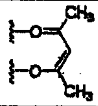
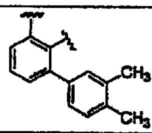
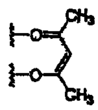
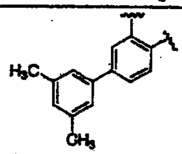
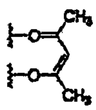
309	H	H	H	H	H	F			2
310	H	H	H	H	H	F			2
311	H	H	H	H	H	F			2
312	H	H	H	H	H	F			2
313	H	H	H	H	H	F			2
314	H	H	H	H	H	F			2
315	H	H	H	H	H	F			2
316	H	H	H	H	H	F			2
317	H	H	H	H	H	F			2
318	H	H	H	H	H	F			2

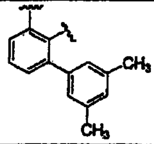
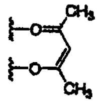
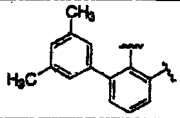
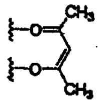
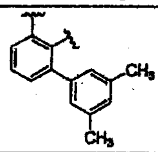
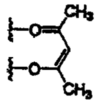
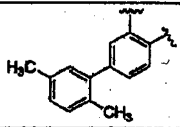
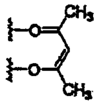
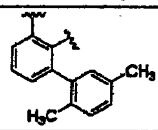
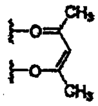
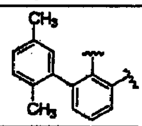
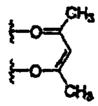
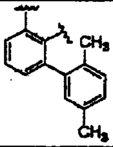
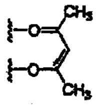
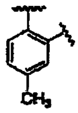
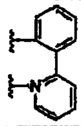
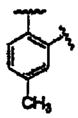
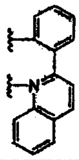
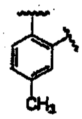
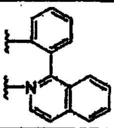
319	H	H	H	H	H	F			2
320	H	H	H	H	H	F			2
321	H	H	H	H	H	F			2
322	H	H	H	H	H	F			2
323	H	H	H	H	H	F			2
324	H	H	H	H	H	F			2
325	H	H	H	H	H	F			2
326	H	H	H	H	H	F			2
327	H	H	H	H	H	F			2

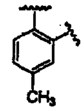
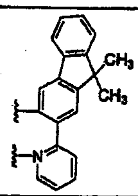
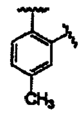
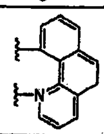
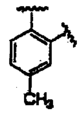
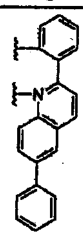
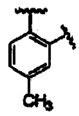
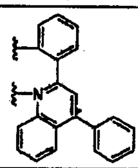
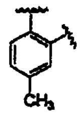
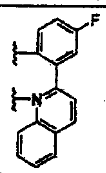
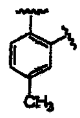
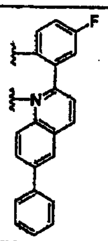
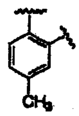
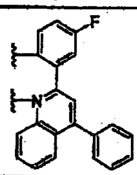
328	H	H	H	H	H	F			2
329	H	H	H	H	H	F			2
330	H	H	H	H	H	F			2
331	H	H	H	H	H	F			2
332	H	H	H	H	H	F			2
333	H	H	H	H	H	F			2
334	H	H	H	H	H	F			2
335	H	H	H	H	H	F			2
336	H	H	H	H	H	F			2

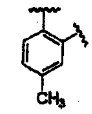
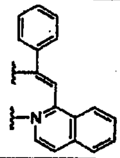
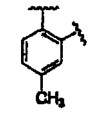
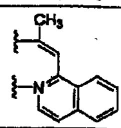
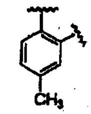
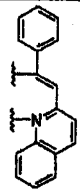
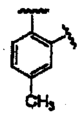
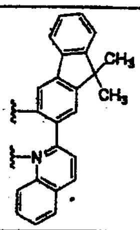
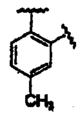
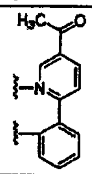
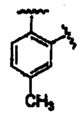
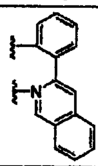
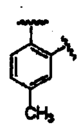
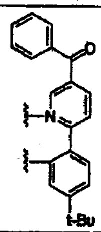
337	H	H	H	H	H	F			2
338	H	H	H	H	H	F			2
339	H	H	H	H	H	F			2
340	H	H	H	H	H	F			2
341	H	H	H	H	H	F			2
342	H	H	H	H	H	F			2
343	H	H	H	H	H	F			2
344	H	H	H	H	H	F			2

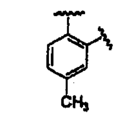
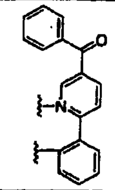
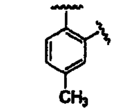
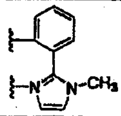
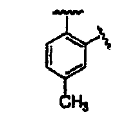
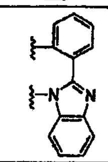
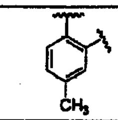
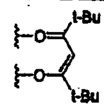
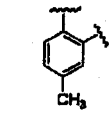
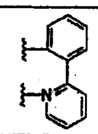
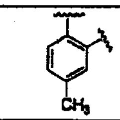
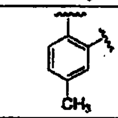
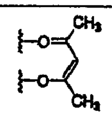
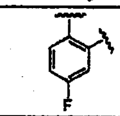
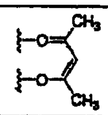
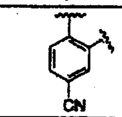
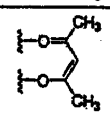
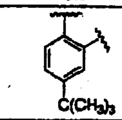
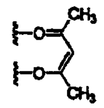
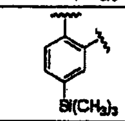
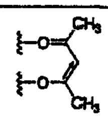
345	H	H	H	H	H	F			2
346	H	H	H	H	H	F			2
347	H	H	H	H	H	F			2
348	H	H	H	H	H	F			2
349	H	H	H	H	H	F			2
350	H	H	H	H	H	F			2
351	H	H	H	H	H	F			2
352	H	H	H	H	H	F			2
353	H	H	H	H	H	F			2
354	H	H	H	H	H	F			2
355	H	H	H	H	H	F			2

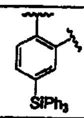
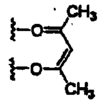
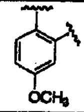
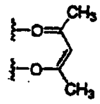
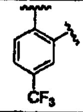
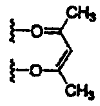
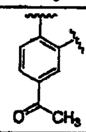
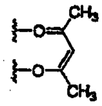
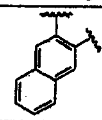
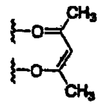
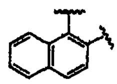
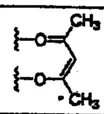
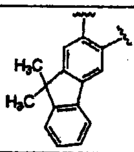
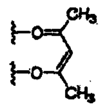
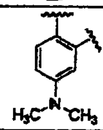
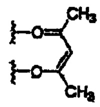
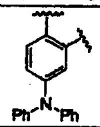
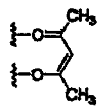
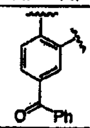
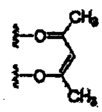
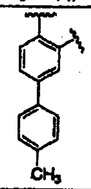
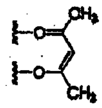
356	H	H	H	H	H	F			2
357	H	H	H	H	H	F			2
358	H	H	H	H	H	F			2
359	H	H	H	H	H	F			2
360	H	H	H	H	H	F			2
361	H	H	H	H	H	F			2
362	H	H	H	H	H	F			2
363	H	H	H	H	H	F			2
364	H	H	H	H	H	F			2
365	H	H	H	H	H	F			2
366	H	H	H	H	H	F			2

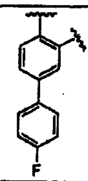
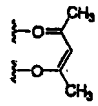
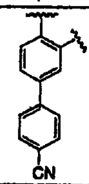
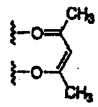
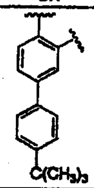
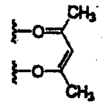
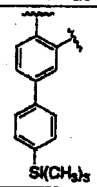
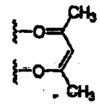
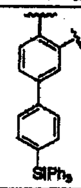
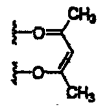
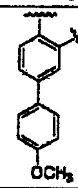
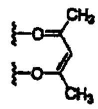
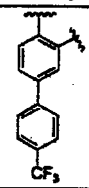
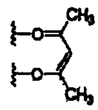
367	H	H	H	H	H	F			2
368	H	H	H	H	H	F			2
369	H	H	H	H	H	F			2
370	H	H	H	H	H	F			2
371	H	H	H	H	H	F			2
372	H	H	H	H	H	F			2
373	H	H	H	H	H	F			2
374	H	H	H	H	H	F			2
375	H	H	H	H	H	F			2
376	H	H	H	H	H	F			2

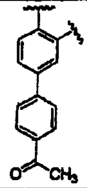
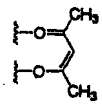
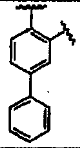
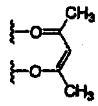
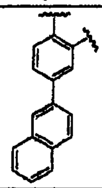
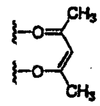
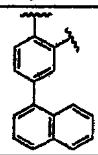
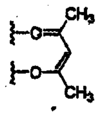
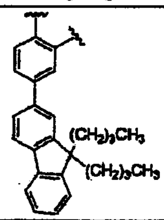
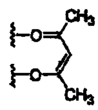
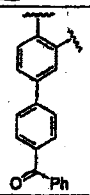
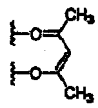
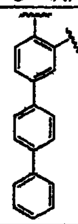
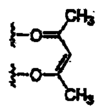
377	H	H	H	H	H	F			2
378	H	H	H	H	H	F			2
379	H	H	H	H	H	F			2
380	H	H	H	H	H	F			2
381	H	H	H	H	H	F			2
382	H	H	H	H	H	F			2
383	H	H	H	H	H	F			2

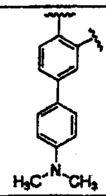
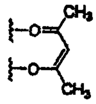
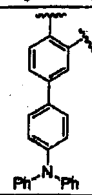
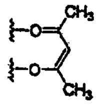
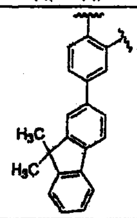
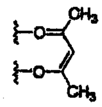
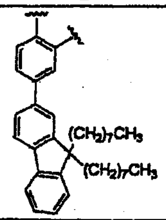
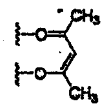
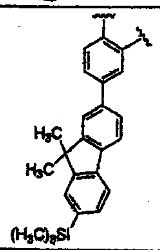
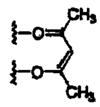
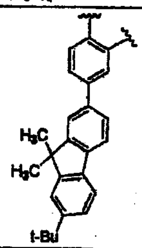
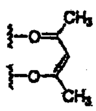
384	H	H	H	H	H	F			2
385	H	H	H	H	H	F			2
386	H	H	H	H	H	F			2
387	H	H	H	H	H	F			2
388	H	H	H	H	H	F			2
389	H	H	H	H	H	F			2
390	H	H	H	H	H	F			2

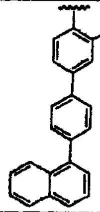
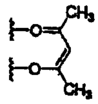
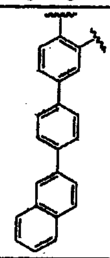
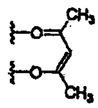
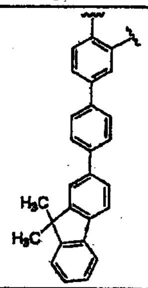
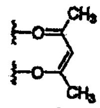
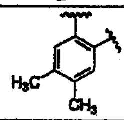
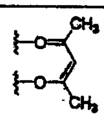
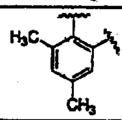
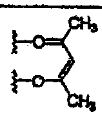
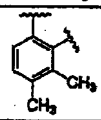
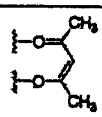
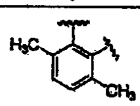
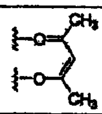
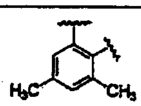
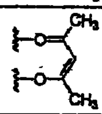
391	H	H	H	H	H	F			2
392	H	H	H	H	H	F			2
393	H	H	H	H	H	F			2
394	H	H	H	H	H	F			2
395	H	H	H	H	H	F			1
396	H	H	H	H	H	F		–	3
397	H	H	H	H	H	$-CH_3$			2
398	H	H	H	H	H	$-CH_3$			2
399	H	H	H	H	H	$-CH_3$			2
400	H	H	H	H	H	$-CH_3$			2
401	H	H	H	H	H	$-CH_3$			2

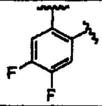
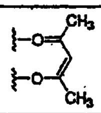
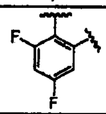
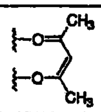
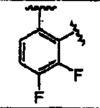
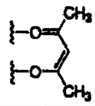
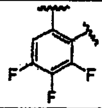
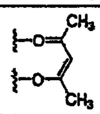
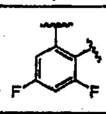
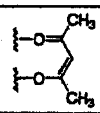
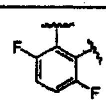
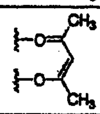
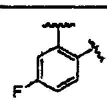
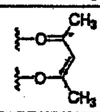
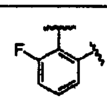
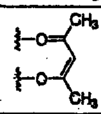
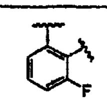
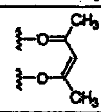
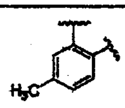
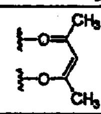
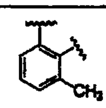
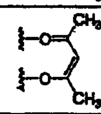
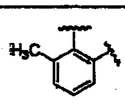
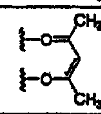
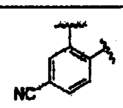
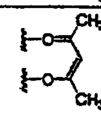
402	H	H	H	H	H	$-CH_3$			2
403	H	H	H	H	H	$-CH_3$			2
404	H	H	H	H	H	$-CH_3$			2
405	H	H	H	H	H	$-CH_3$			2
406	H	H	H	H	H	$-CH_3$			2
407	H	H	H	H	H	$-CH_3$			2
408	H	H	H	H	H	$-CH_3$			2
409	H	H	H	H	H	$-CH_3$			2
410	H	H	H	H	H	$-CH_3$			2
411	H	H	H	H	H	$-CH_3$			2
412	H	H	H	H	H	$-CH_3$			2

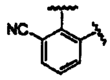
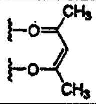
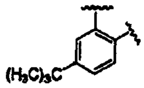
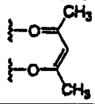
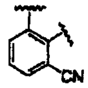
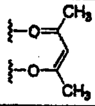
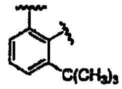
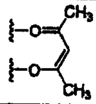
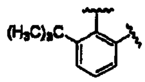
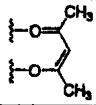
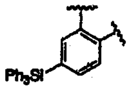
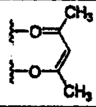
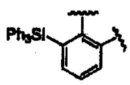
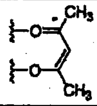
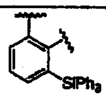
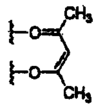
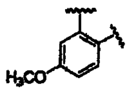
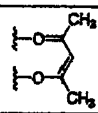
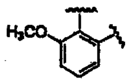
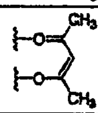
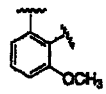
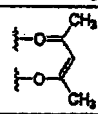
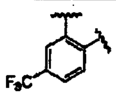
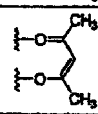
413	H	H	H	H	H	$-CH_3$			2
414	H	H	H	H	H	$-CH_3$			2
415	H	H	H	H	H	$-CH_3$			2
416	H	H	H	H	H	$-CH_3$			2
417	H	H	H	H	H	$-CH_3$			2
418	H	H	H	H	H	$-CH_3$			2
419	H	H	H	H	H	$-CH_3$			2

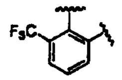
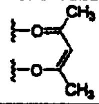
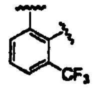
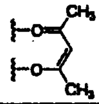
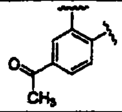
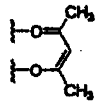
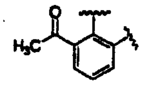
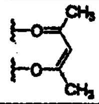
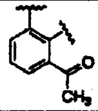
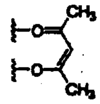
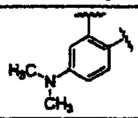
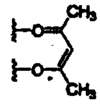
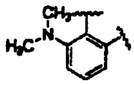
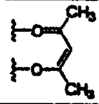
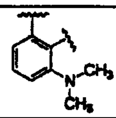
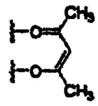
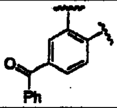
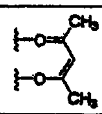
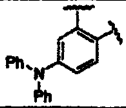
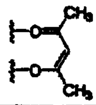
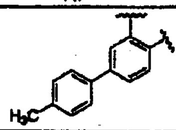
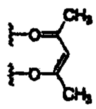
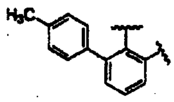
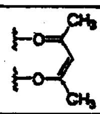
420	H	H	H	H	H	$-CH_3$			2
421	H	H	H	H	H	$-CH_3$			2
422	H	H	H	H	H	$-CH_3$			2
423	H	H	H	H	H	$-CH_3$			2
424	H	H	H	H	H	$-CH_3$			2
425	H	H	H	H	H	$-CH_3$			2
426	H	H	H	H	H	$-CH_3$			2

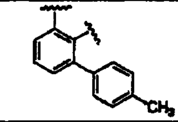
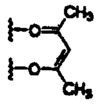
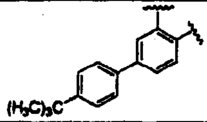
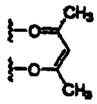
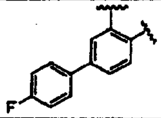
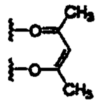
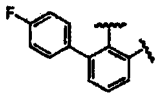
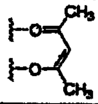
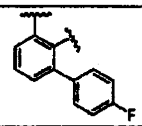
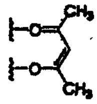
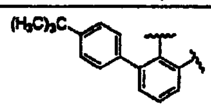
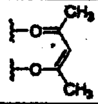
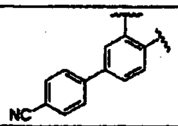
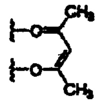
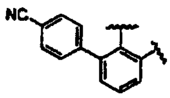
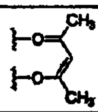
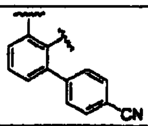
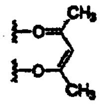
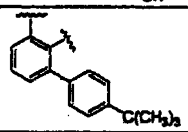
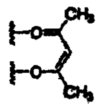
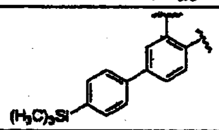
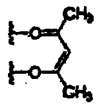
427	H	H	H	H	H	$-CH_3$			2
428	H	H	H	H	H	$-CH_3$			2
429	H	H	H	H	H	$-CH_3$			2
430	H	H	H	H	H	$-CH_3$			2
431	H	H	H	H	H	$-CH_3$			2
432	H	H	H	H	H	$-CH_3$			2

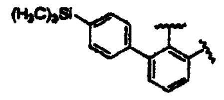
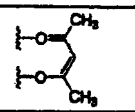
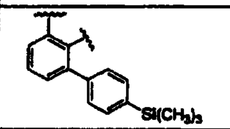
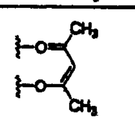
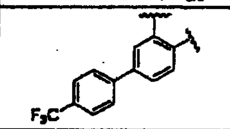
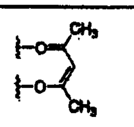
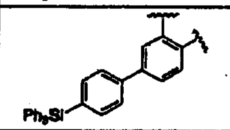
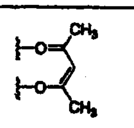
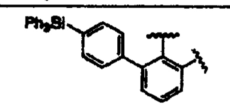
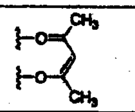
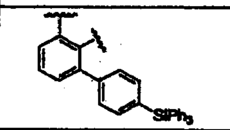
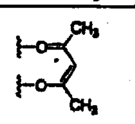
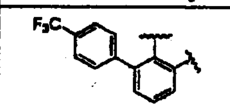
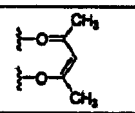
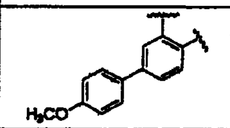
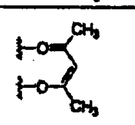
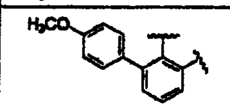
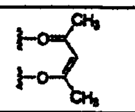
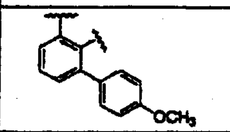
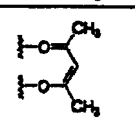
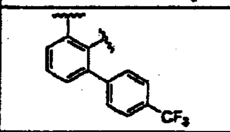
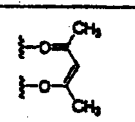
433	H	H	H	H	H	$-CH_3$			2
434	H	H	H	H	H	$-CH_3$			2
435	H	H	H	H	H	$-CH_3$			2
436	H	H	H	H	H	$-CH_3$			2
437	H	H	H	H	H	$-CH_3$			2
438	H	H	H	H	H	$-CH_3$			2
439	H	H	H	H	H	$-CH_3$			2
440	H	H	H	H	H	$-CH_3$			2

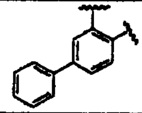
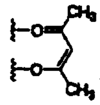
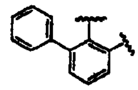
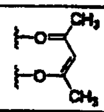
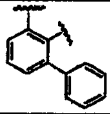
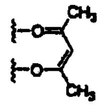
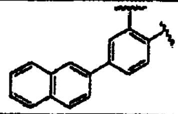
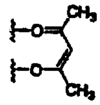
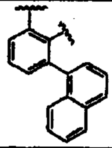
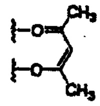
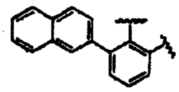
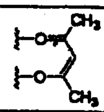
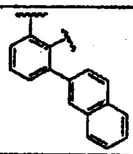
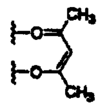
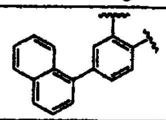
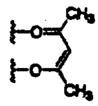
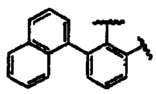
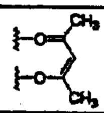
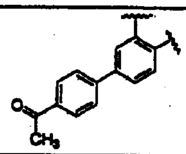
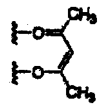
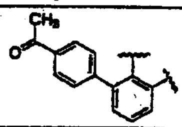
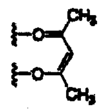
441	H	H	H	H	H	−CH₃			2
442	H	H	H	H	H	−CH₃			2
443	H	H	H	H	H	−CH₃			2
444	H	H	H	H	H	−CH₃			2
445	H	H	H	H	H	−CH₃			2
446	H	H	H	H	H	−CH₃			2
447	H	H	H	H	H	−CH₃			2
448	H	H	H	H	H	−CH₃			2
449	H	H	H	H	H	−CH₃			2
450	H	H	H	H	H	−CH₃			2
451	H	H	H	H	H	−CH₃			2
452	H	H	H	H	H	−CH₃			2
453	H	H	H	H	H	−CH₃			2

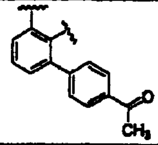
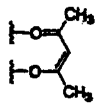
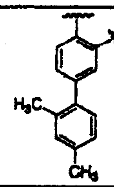
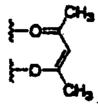
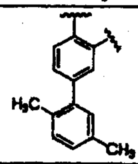
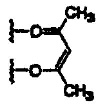
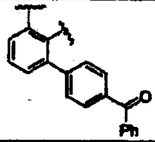
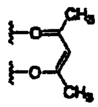
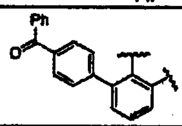
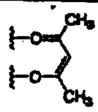
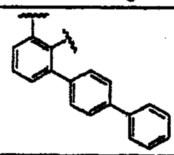
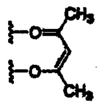
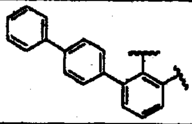
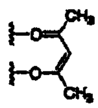
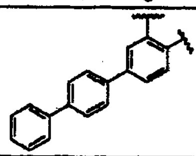
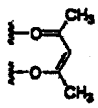
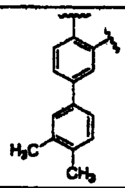
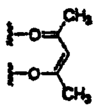
454	H	H	H	H	H	−CH3			2
455	H	H	H	H	H	−CH3			2
456	H	H	H	H	H	−CH3			2
457	H	H	H	H	H	−CH3			2
458	H	H	H	H	H	−CH3			2
459	H	H	H	H	H	−CH3			2
460	H	H	H	H	H	−CH3			2
461	H	H	H	H	H	−CH3			2
462	H	H	H	H	H	−CH3			2
463	H	H	H	H	H	−CH3			2
464	H	H	H	H	H	−CH3			2
465	H	H	H	H	H	−CH3			2

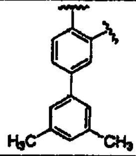
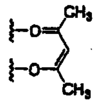
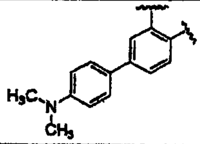
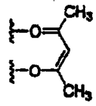
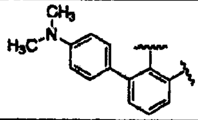
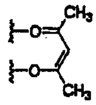
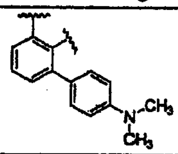
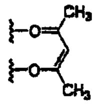
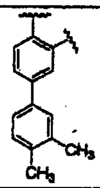
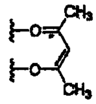
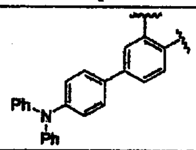
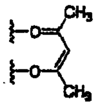
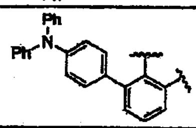
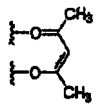
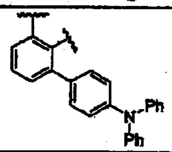
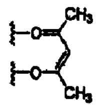
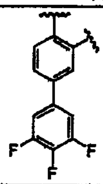
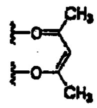
466	H	H	H	H	H	$-CH_3$			2
467	H	H	H	H	H	$-CH_3$			2
468	H	H	H	H	H	$-CH_3$			2
469	H	H	H	H	H	$-CH_3$			2
470	H	H	H	H	H	$-CH_3$			2
471	H	H	H	H	H	$-CH_3$			2
472	H	H	H	H	H	$-CH_3$			2
473	H	H	H	H	H	$-CH_3$			2
474	H	H	H	H	H	$-CH_3$			2
475	H	H	H	H	H	$-CH_3$			2
476	H	H	H	H	H	$-CH_3$			2
477	H	H	H	H	H	$-CH_3$			2

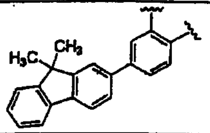
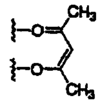
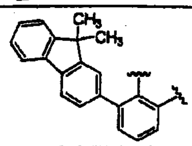
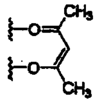
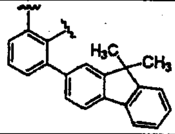
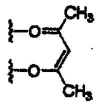
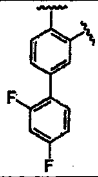
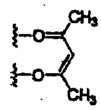
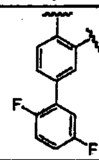
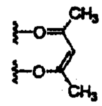
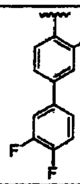
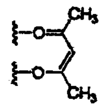
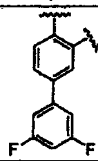
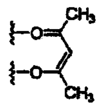
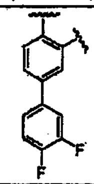
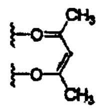
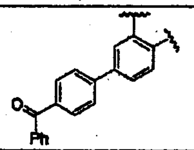
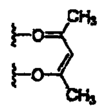
478	H	H	H	H	H	$-CH_3$			2
479	H	H	H	H	H	$-CH_3$			2
480	H	H	H	H	H	$-CH_3$			2
481	H	H	H	H	H	$-CH_3$			2
482	H	H	H	H	H	$-CH_3$			2
483	H	H	H	H	H	$-CH_3$			2
484	H	H	H	H	H	$-CH_3$			2
485	H	H	H	H	H	$-CH_3$			2
486	H	H	H	H	H	$-CH_3$			2
487	H	H	H	H	H	$-CH_3$			2
488	H	H	H	H	H	$-CH_3$			2

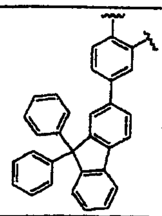
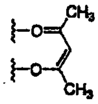
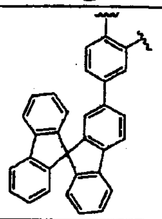
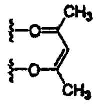
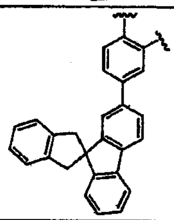
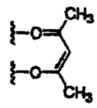
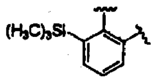
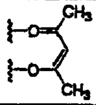
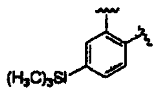
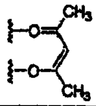
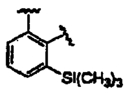
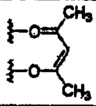
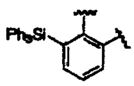
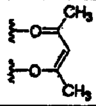
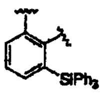
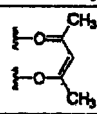
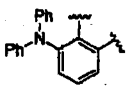
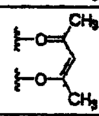
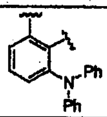
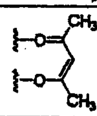
489	H	H	H	H	H	$-CH_3$			2
490	H	H	H	H	H	$-CH_3$			2
491	H	H	H	H	H	$-CH_3$			2
492	H	H	H	H	H	$-CH_3$			2
493	H	H	H	H	H	$-CH_3$			2
494	H	H	H	H	H	$-CH_3$			2
495	H	H	H	H	H	$-CH_3$			2
496	H	H	H	H	H	$-CH_3$			2
497	H	H	H	H	H	$-CH_3$			2
498	H	H	H	H	H	$-CH_3$			2
499	H	H	H	H	H	$-CH_3$			2

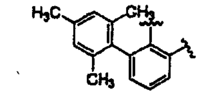
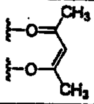
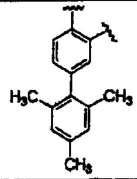
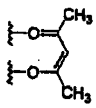
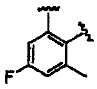
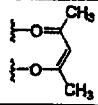
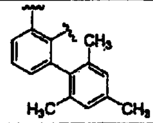
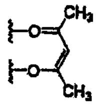
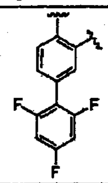
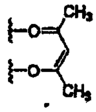
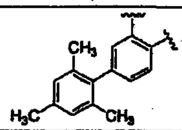
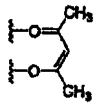
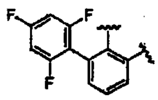
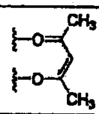
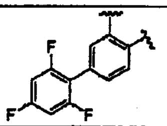
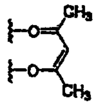
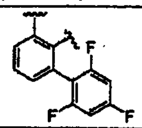
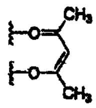
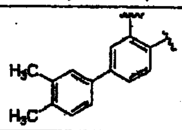
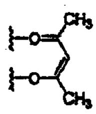
500	H	H	H	H	H	$-CH_3$			2
501	H	H	H	H	H	$-CH_3$			2
502	H	H	H	H	H	$-CH_3$			2
503	H	H	H	H	H	$-CH_3$			2
504	H	H	H	H	H	$-CH_3$			2
505	H	H	H	H	H	$-CH_3$			2
506	H	H	H	H	H	$-CH_3$			2
507	H	H	H	H	H	$-CH_3$			2
508	H	H	H	H	H	$-CH_3$			2
509	H	H	H	H	H	$-CH_3$			2
510	H	H	H	H	H	$-CH_3$			2

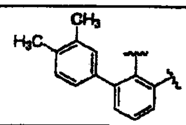
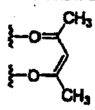
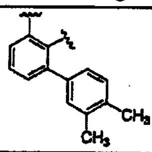
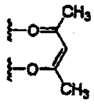
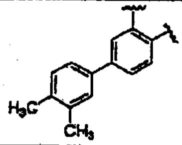
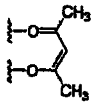
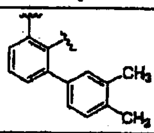
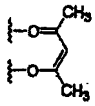
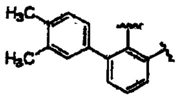
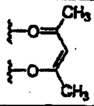
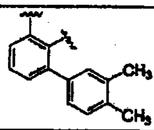
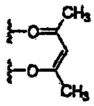
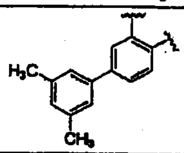
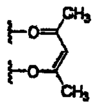
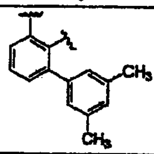
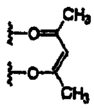
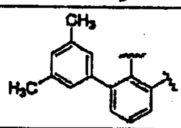
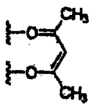
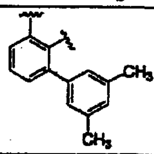
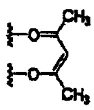
511	H	H	H	H	H	$-CH_3$			2
512	H	H	H	H	H	$-CH_3$			2
513	H	H	H	H	H	$-CH_3$			2
514	H	H	H	H	H	$-CH_3$			2
515	H	H	H	H	H	$-CH_3$			2
516	H	H	H	H	H	$-CH_3$			2
517	H	H	H	H	H	$-CH_3$			2
518	H	H	H	H	H	$-CH_3$			2
519	H	H	H	H	H	$-CH_3$			2

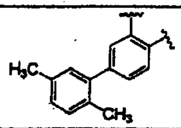
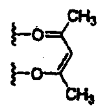
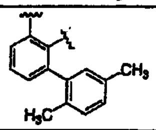
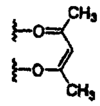
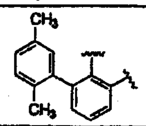
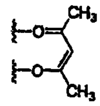
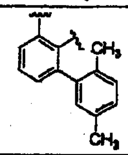
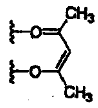
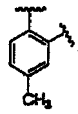
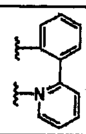
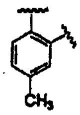
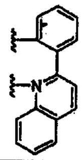
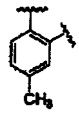
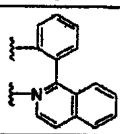
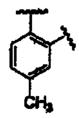
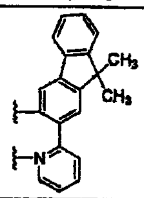
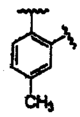
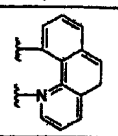
520	H	H	H	H	H	−CH₃			2
521	H	H	H	H	H	−CH₃			2
522	H	H	H	H	H	−CH₃			2
523	H	H	H	H	H	−CH₃			2
524	H	H	H	H	H	−CH₃			2
525	H	H	H	H	H	−CH₃			2
526	H	H	H	H	H	−CH₃			2
527	H	H	H	H	H	−CH₃			2
528	H	H	H	H	H	−CH₃			2

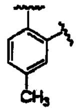
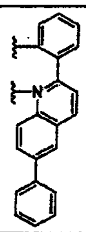
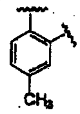
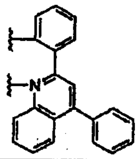
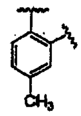
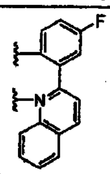
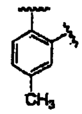
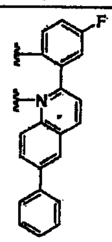
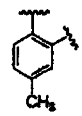
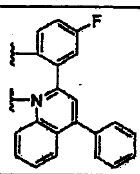
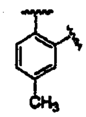
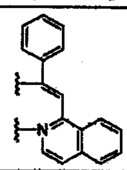
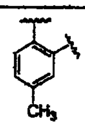
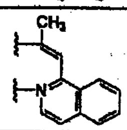
529	H	H	H	H	H	$-CH_3$			2
530	H	H	H	H	H	$-CH_3$			2
531	H	H	H	H	H	$-CH_3$			2
532	H	H	H	H	H	$-CH_3$			2
533	H	H	H	H	H	$-CH_3$			2
534	H	H	H	H	H	$-CH_3$			2
535	H	H	H	H	H	$-CH_3$			2
536	H	H	H	H	H	$-CH_3$			2
537	H	H	H	H	H	$-CH_3$			2

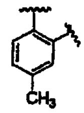
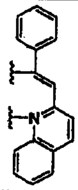
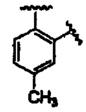
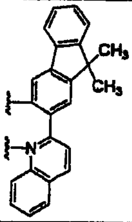
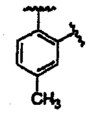
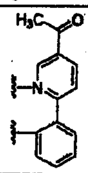
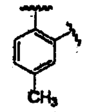
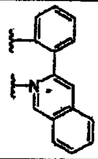
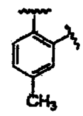
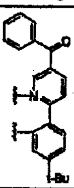
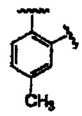
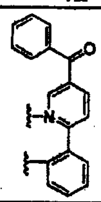
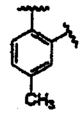
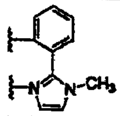
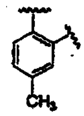
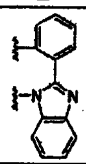
538	H	H	H	H	H	$-CH_3$			2
539	H	H	H	H	H	$-CH_3$			2
540	H	H	H	H	H	$-CH_3$			2
541	H	H	H	H	H	$-CH_3$			2
542	H	H	H	H	H	$-CH_3$			2
543	H	H	H	H	H	$-CH_3$			2
544	H	H	H	H	H	$-CH_3$			2
545	H	H	H	H	H	$-CH_3$			2
546	H	H	H	H	H	$-CH_3$			2
547	H	H	H	H	$-CH_3$	$-CH_3$			2

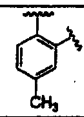
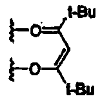
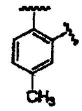
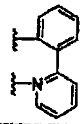
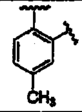
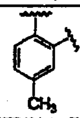
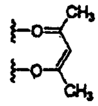
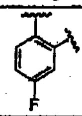
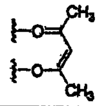
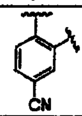
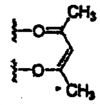
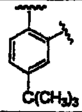
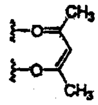
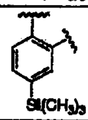
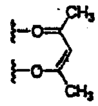
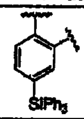
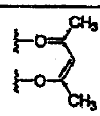
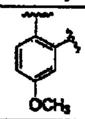
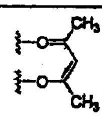
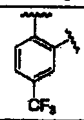
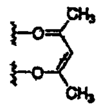
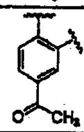
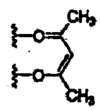
548	H	H	H	H	H	$-CH_3$			2
549	H	H	H	H	H	$-CH_3$			2
550	H	H	H	H	H	$-CH_3$			2
551	H	H	H	H	H	$-CH_3$			2
552	H	H	H	H	H	$-CH_3$			2
553	H	H	H	H	H	$-CH_3$			2
554	H	H	H	H	H	$-CH_3$			2
555	H	H	H	H	H	$-CH_3$			2
557	H	H	H	H	H	$-CH_3$			2
558	H	H	H	H	H	$-CH_3$			2

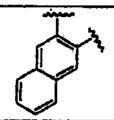
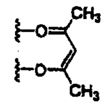
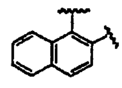
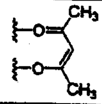
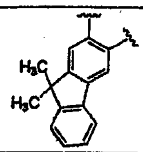
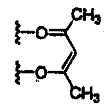
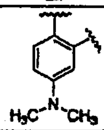
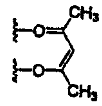
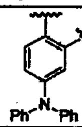
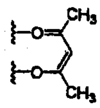
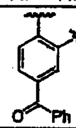
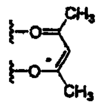
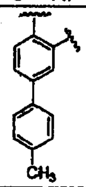
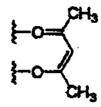
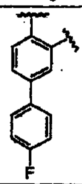
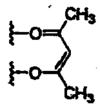
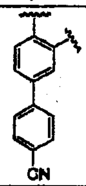
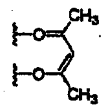
559	H	H	H	H	H	$-CH_3$			2
560	H	H	H	H	H	$-CH_3$			2
561	H	H	H	H	H	$-CH_3$			2
562	H	H	H	H	H	$-CH_3$			2
563	H	H	H	H	H	$-CH_3$			2
564	H	H	H	H	H	$-CH_3$			2
565	H	H	H	H	H	$-CH_3$			2
566	H	H	H	H	H	$-CH_3$			2
567	H	H	H	H	H	$-CH_3$			2
568	H	H	H	H	H	$-CH_3$			2

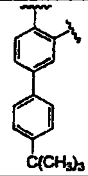
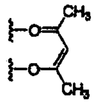
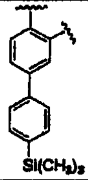
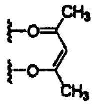
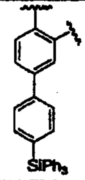
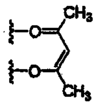
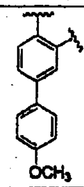
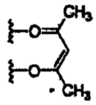
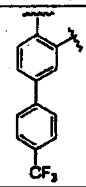
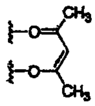
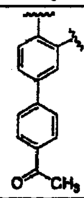
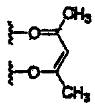
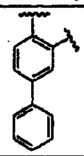
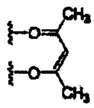
569	H	H	H	H	H	$-CH_3$			2
570	H	H	H	H	H	$-CH_3$			2
571	H	H	H	H	H	$-CH_3$			2
572	H	H	H	H	H	$-CH_3$			2
573	H	H	H	H	H	$-CH_3$			2
574	H	H	H	H	H	$-CH_3$			2
575	H	H	H	H	H	$-CH_3$			2
576	H	H	H	H	H	$-CH_3$			2
577	H	H	H	H	H	$-CH_3$			2

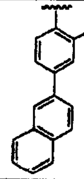
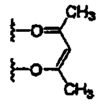
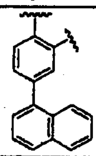
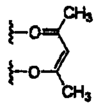
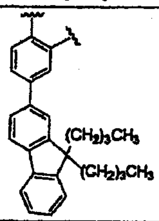
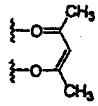
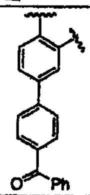
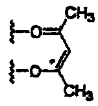
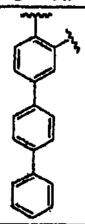
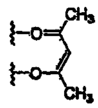
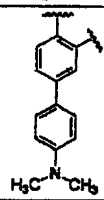
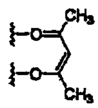
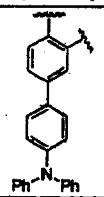
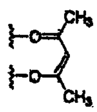
578	H	H	H	H	H	$-CH_3$			2
579	H	H	H	H	H	$-CH_3$			2
580	H	H	H	H	H	$-CH_3$			2
581	H	H	H	H	H	$-CH_3$			2
582	H	H	H	H	H	$-CH_3$			2
583	H	H	H	H	H	$-CH_3$			2
584	H	H	H	H	H	$-CH_3$			2

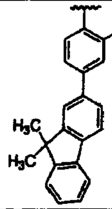
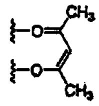
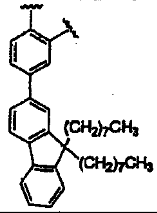
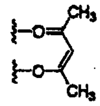
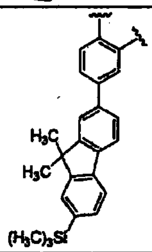
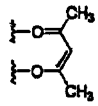
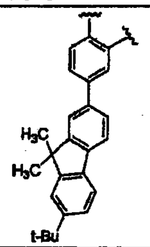
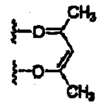
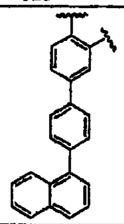
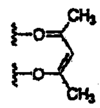
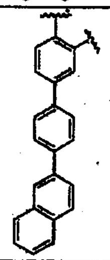
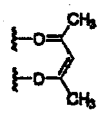
585	H	H	H	H	H	−CH₃			2
586	H	H	H	H	H	−CH₃			2
587	H	H	H	H	H	−CH₃			2
588	H	H	H	H	H	−CH₃			2
589	H	H	H	H	H	−CH₃			2
590	H	H	H	H	H	−CH₃			2
591	H	H	H	H	H	−CH₃			2
592	H	H	H	H	H	−CH₃			2

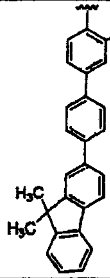
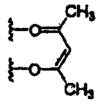
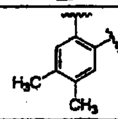
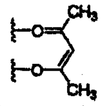
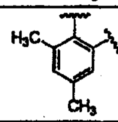
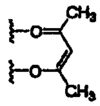
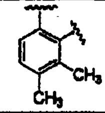
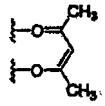
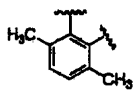
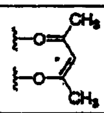
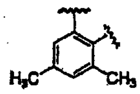
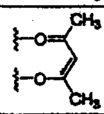
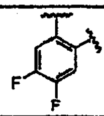
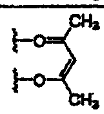
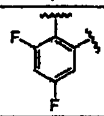
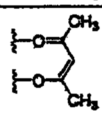
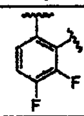
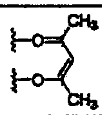
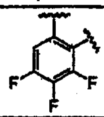
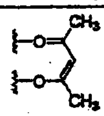
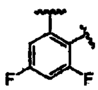
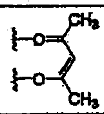
593	H	H	H	H	H	$-CH_3$			2
594	H	H	H	H	H	$-CH_3$			1
595	H	H	H	H	H	$-CH_3$		-	3
596	H	H	H	H	H	$-C(CH_3)_3$			2
597	H	H	H	H	H	$-C(CH_3)_3$			2
598	H	H	H	H	H	$-C(CH_3)_3$			2
599	H	H	H	H	H	$-C(CH_3)_3$			2
600	H	H	H	H	H	$-C(CH_3)_3$			2
601	H	H	H	H	H	$-C(CH_3)_3$			2
602	H	H	H	H	H	$-C(CH_3)_3$			2
603	H	H	H	H	H	$-C(CH_3)_3$			2
604	H	H	H	H	H	$-C(CH_3)_3$			2

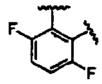
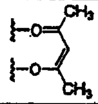
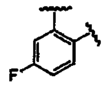
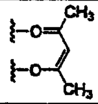
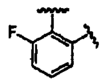
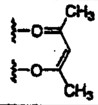
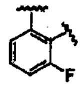
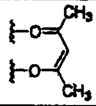
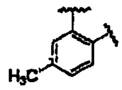
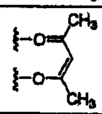
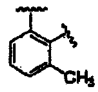
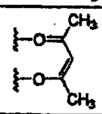
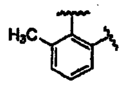
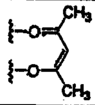
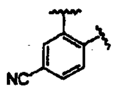
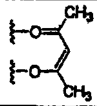
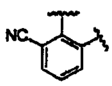
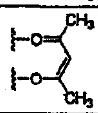
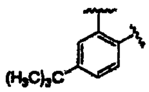
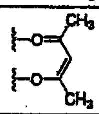
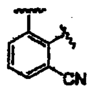
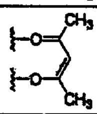
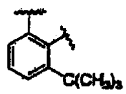
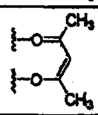
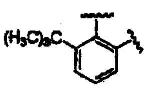
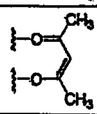
605	H	H	H	H	H	$-C(CH_3)_3$			2
606	H	H	H	H	H	$-C(CH_3)_3$			2
607	H	H	H	H	H	$-C(CH_3)_3$			2
608	H	H	H	H	H	$-C(CH_3)_3$			2
609	H	H	H	H	H	$-C(CH_3)_3$			2
610	H	H	H	H	H	$-C(CH_3)_3$			2
611	H	H	H	H	H	$-C(CH_3)_3$			2
612	H	H	H	H	H	$-C(CH_3)_3$			2
613	H	H	H	H	H	$-C(CH_3)_3$			2

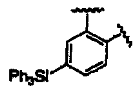
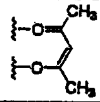
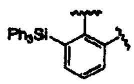
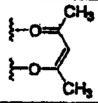
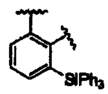
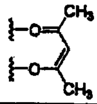
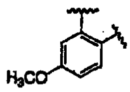
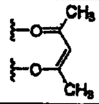
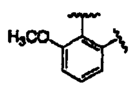
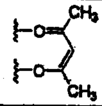
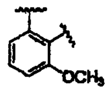
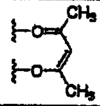
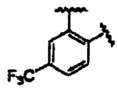
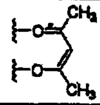
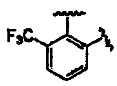
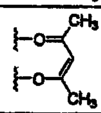
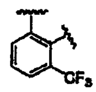
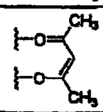
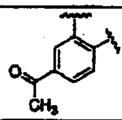
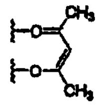
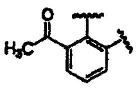
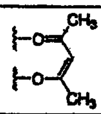
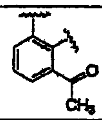
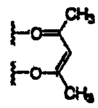
614	H	H	H	H	H	$-C(CH_3)_3$			2
615	H	H	H	H	H	$-C(CH_3)_3$			2
616	H	H	H	H	H	$-C(CH_3)_3$			2
617	H	H	H	H	H	$-C(CH_3)_3$			2
618	H	H	H	H	H	$-C(CH_3)_3$			2
619	H	H	H	H	H	$-C(CH_3)_3$			2
620	H	H	H	H	H	$-C(CH_3)_3$			2

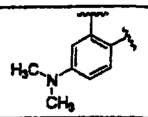
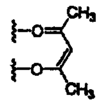
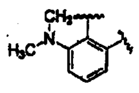
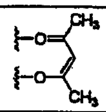
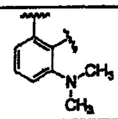
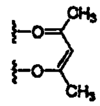
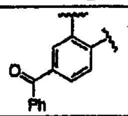
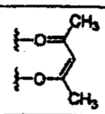
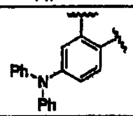
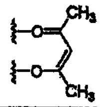
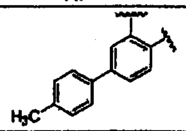
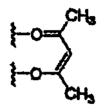
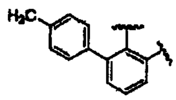
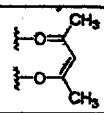
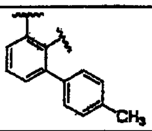
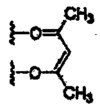
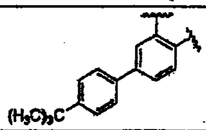
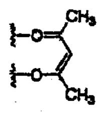
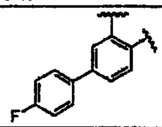
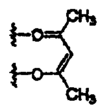
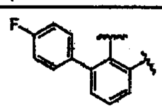
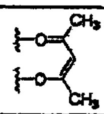
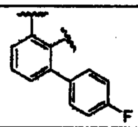
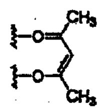
621	H	H	H	H	H	-C(CH3)3			2
622	H	H	H	H	H	-C(CH3)3			2
623	H	H	H	H	H	-C(CH3)3			2
624	H	H	H	H	H	-C(CH3)3			2
625	H	H	H	H	H	-C(CH3)3			2
626	H	H	H	H	H	-C(CH3)3			2
627	H	H	H	H	H	-C(CH3)3			2

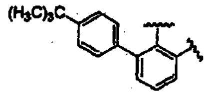
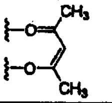
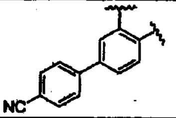
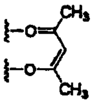
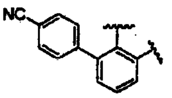
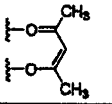
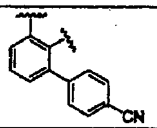
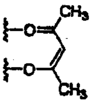
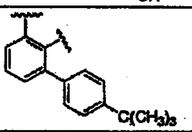
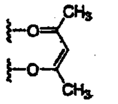
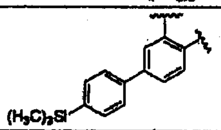
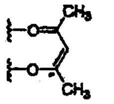
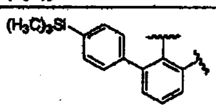
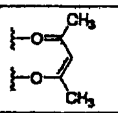
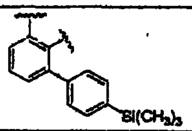
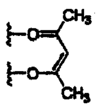
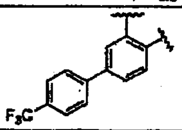
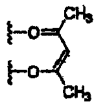
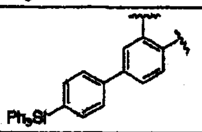
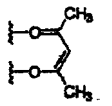
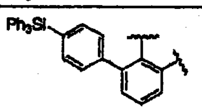
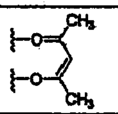
628	H	H	H	H	H	$-C(CH_3)_3$			2
629	H	H	H	H	H	$-C(CH_3)_3$			2
630	H	H	H	H	H	$-C(CH_3)_3$			2
631	H	H	H	H	H	$-C(CH_3)_3$			2
632	H	H	H	H	H	$-C(CH_3)_3$			2
633	H	H	H	H	H	$-C(CH_3)_3$			2

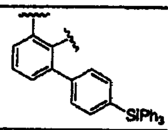
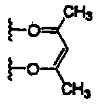
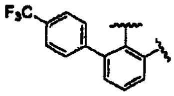
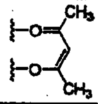
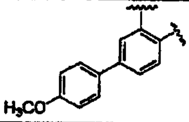
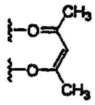
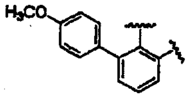
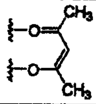
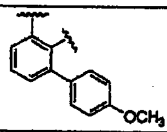
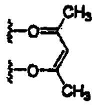
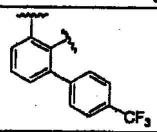
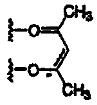
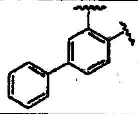
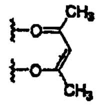
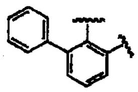
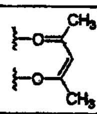
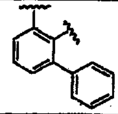
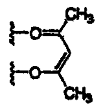
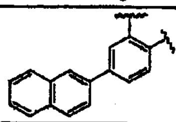
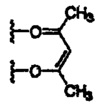
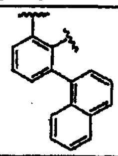
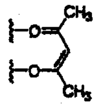
634	H	H	H	H	H	$-C(CH_3)_3$			2
635	H	H	H	H	H	$-C(CH_3)_3$			2
636	H	H	H	H	H	$-C(CH_3)_3$			2
637	H	H	H	H	H	$-C(CH_3)_3$			2
638	H	H	H	H	H	$-C(CH_3)_3$			2
639	H	H	H	H	H	$-C(CH_3)_3$			2
640	H	H	H	H	H	$-C(CH_3)_3$			2
641	H	H	H	H	H	$-C(CH_3)_3$			2
642	H	H	H	H	H	$-C(CH_3)_3$			2
643	H	H	H	H	H	$-C(CH_3)_3$			2
644	H	H	H	H	H	$-C(CH_3)_3$			2

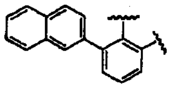
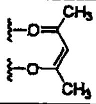
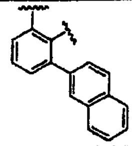
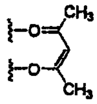
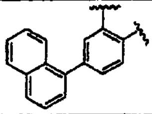
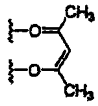
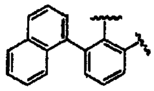
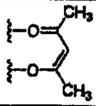
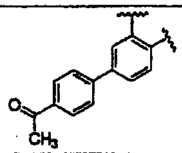
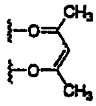
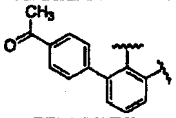
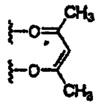
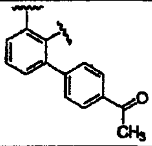
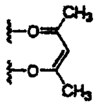
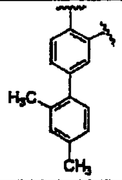
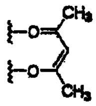
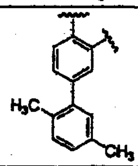
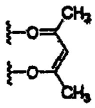
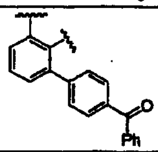
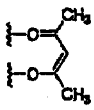
645	H	H	H	H	H	$-C(CH_3)_3$			2
646	H	H	H	H	H	$-C(CH_3)_3$			2
647	H	H	H	H	H	$-C(CH_3)_3$			2
648	H	H	H	H	H	$-C(CH_3)_3$			2
649	H	H	H	H	H	$-C(CH_3)_3$			2
650	H	H	H	H	H	$-C(CH_3)_3$			2
651	H	H	H	H	H	$-C(CH_3)_3$			2
652	H	H	H	H	H	$-C(CH_3)_3$			2
653	H	H	H	H	H	$-C(CH_3)_3$			2
654	H	H	H	H	H	$-C(CH_3)_3$			2
655	H	H	H	H	H	$-C(CH_3)_3$			2
656	H	H	H	H	H	$-C(CH_3)_3$			2
657	H	H	H	H	H	$-C(CH_3)_3$			2

658	H	H	H	H	H	$-C(CH_3)_3$			2
659	H	H	H	H	H	$-C(CH_3)_3$			2
660	H	H	H	H	H	$-C(CH_3)_3$			2
661	H	H	H	H	H	$-C(CH_3)_3$			2
662	H	H	H	H	H	$-C(CH_3)_3$			2
663	H	H	H	H	H	$-C(CH_3)_3$			2
664	H	H	H	H	H	$-C(CH_3)_3$			2
665	H	H	H	H	H	$-C(CH_3)_3$			2
666	H	H	H	H	H	$-C(CH_3)_3$			2
667	H	H	H	H	H	$-C(CH_3)_3$			2
668	H	H	H	H	H	$-C(CH_3)_3$			2
669	H	H	H	H	H	$-C(CH_3)_3$			2

670	H	H	H	H	H	$-C(CH_3)_3$			2
671	H	H	H	H	H	$-C(CH_3)_3$			2
672	H	H	H	H	H	$-C(CH_3)_3$			2
673	H	H	H	H	H	$-C(CH_3)_3$			2
674	H	H	H	H	H	$-C(CH_3)_3$			2
675	H	H	H	H	H	$-C(CH_3)_3$			2
676	H	H	H	H	H	$-C(CH_3)_3$			2
677	H	H	H	H	H	$-C(CH_3)_3$			2
678	H	H	H	H	H	$-C(CH_3)_3$			2
679	H	H	H	H	H	$-C(OH_3)_3$			2
680	H	H	H	H	H	$-C(CH_3)_3$			2
681	H	H	H	H	H	$-C(CH_3)_3$			2

682	H	H	H	H	H	$-C(CH_3)_3$			2
683	H	H	H	H	H	$-C(CH_3)_3$			2
684	H	H	H	H	H	$-C(CH_3)_3$			2
685	H	H	H	H	H	$-C(CH_3)_3$			2
686	H	H	H	H	H	$-C(CH_3)_3$			2
687	H	H	H	H	H	$-C(CH_3)_3$			2
688	H	H	H	H	H	$-C(CH_3)_3$			2
689	H	H	H	H	H	$-C(CH_3)_3$			2
690	H	H	H	H	H	$-C(CH_3)_3$			2
691	H	H	H	H	H	$-C(CH_3)_3$			2
692	H	H	H	H	H	$-C(CH_3)_3$			2

693	H	H	H	H	H	−C(CH₃)₃			2
694	H	H	H	H	H	−C(CH₃)₃			2
695	H	H	H	H	H	−C(CH₃)₃			2
696	H	H	H	H	H	−C(CH₃)₃			2
697	H	H	H	H	H	−C(CH₃)₃			2
698	H	H	H	H	H	−C(CH₃)₃			2
699	H	H	H	H	H	−C(CH₃)₃			2
700	H	H	H	H	H	−C(CH₃)₃			2
701	H	H	H	H	H	−C(CH₃)₃			2
702	H	H	H	H	H	−C(CH₃)₃			2
703	H	H	H	H	H	−C(CH₃)₃			2

704	H	H	H	H	H	$-C(CH_3)_3$			2
705	H	H	H	H	H	$-C(CH_3)_3$			2
706	H	H	H	H	H	$-C(CH_3)_3$			2
707	H	H	H	H	H	$-C(CH_3)_3$			2
708	H	H	H	H	H	$-C(CH_3)_3$			2
709	H	H	H	H	H	$-C(CH_3)_3$			2
710	H	H	H	H	H	$-C(CH_3)_3$			2
711	H	H	H	H	H	$-C(CH_3)_3$			2
712	H	H	H	H	H	$-C(CH_3)_3$			2
713	H	H	H	H	H	$-C(CH_3)_3$			2

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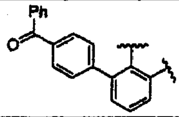
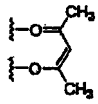
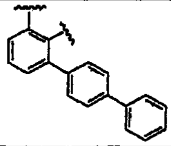
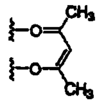
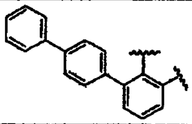
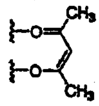
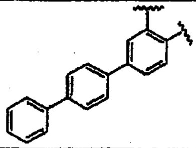
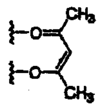
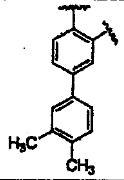
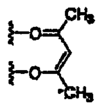
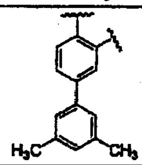
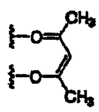
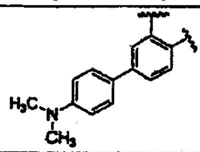
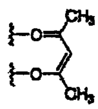
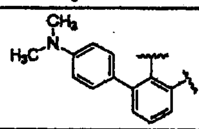
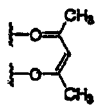
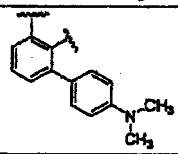
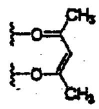
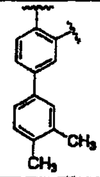
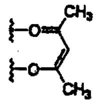
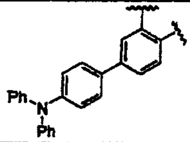
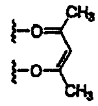
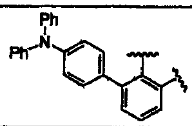
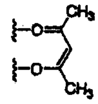
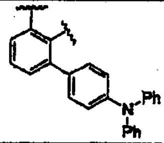
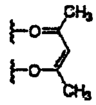
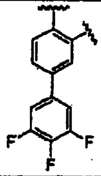
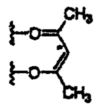
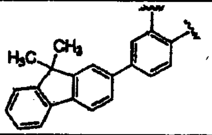
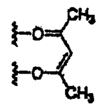
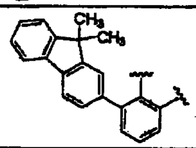
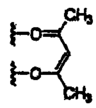
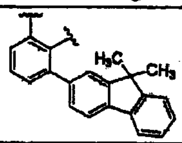
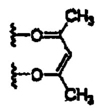
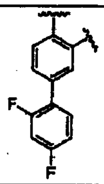
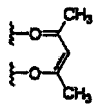
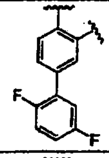
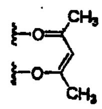
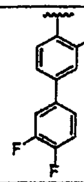
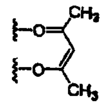
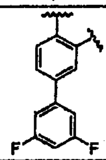
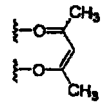
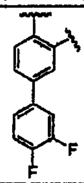
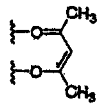
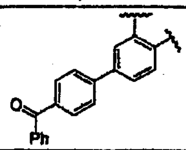
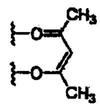
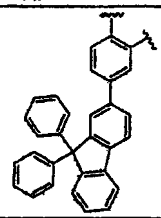
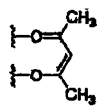
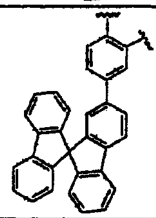
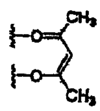
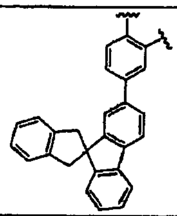
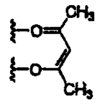
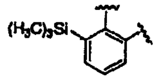
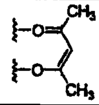
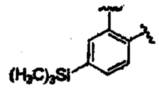
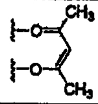
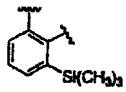
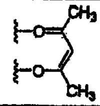
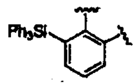
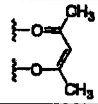
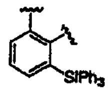
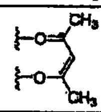
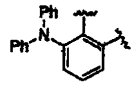
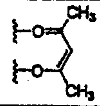
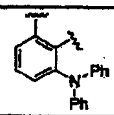
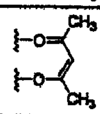
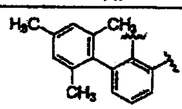
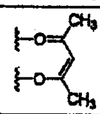
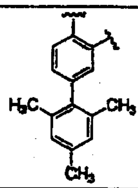
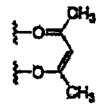
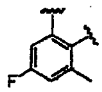
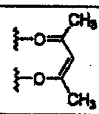
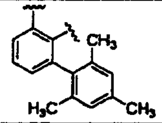
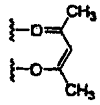
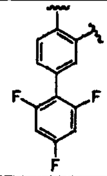
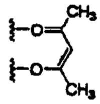
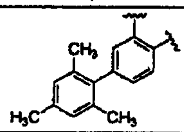
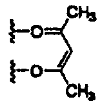
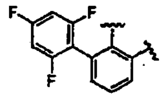
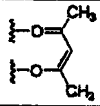
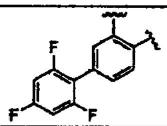
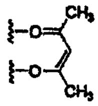
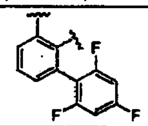
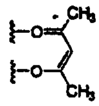
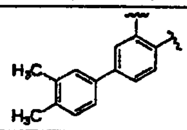
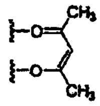
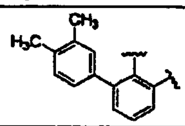
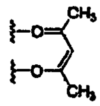
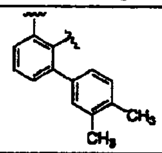
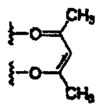
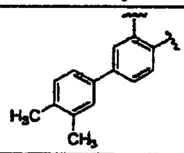
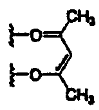
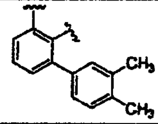
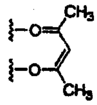
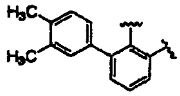
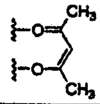
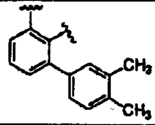
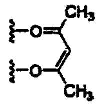
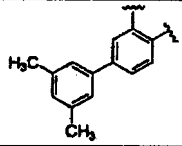
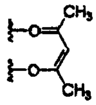
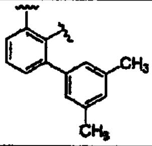
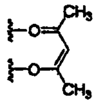
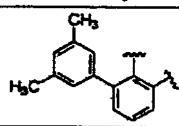
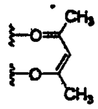
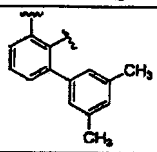
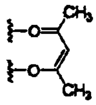
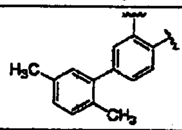
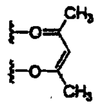
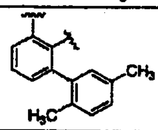
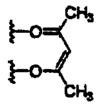
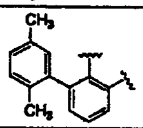
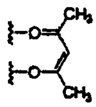
714	H	H	H	H	H	$-C(CH_3)_3$			2
715	H	H	H	H	H	$-C(CH_3)_3$			2
716	H	H	H	H	H	$-C(CH_3)_3$			2
717	H	H	H	H	H	$-C(CH_3)_3$			2
718	H	H	H	H	H	$-C(CH_3)_3$			2
719	H	H	H	H	H	$-C(CH_3)_3$			2
720	H	H	H	H	H	$-C(CH_3)_3$			2
721	H	H	H	H	H	$-C(CH_3)_3$			2
722	H	H	H	H	H	$-C(CH_3)_3$			2

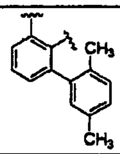
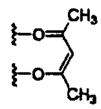
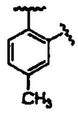
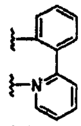
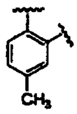
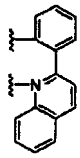
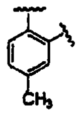
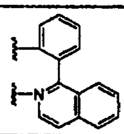
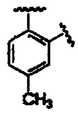
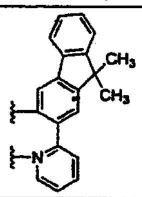
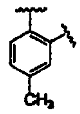
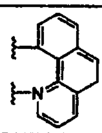
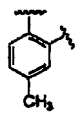
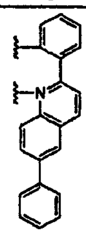
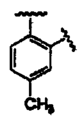
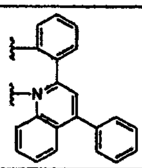
723	H	H	H	H	H	-C(CH3)3			2
724	H	H	H	H	H	-C(CH3)3			2
725	H	H	H	H	H	-C(CH3)3			2
726	H	H	H	H	H	-C(CH3)3			2
727	H	H	H	H	H	-C(CH3)3			2
728	H	H	H	H	H	-C(CH3)3			2
729	H	H	H	H	H	-C(CH3)3			2
730	H	H	H	H	H	-C(CH3)3			2
731	H	H	H	H	H	-C(CH3)3			2

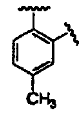
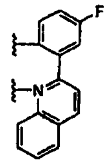
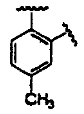
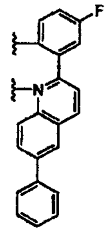
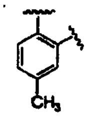
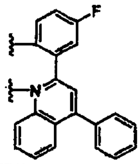
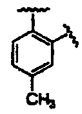
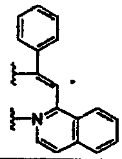
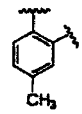
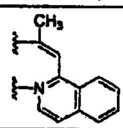
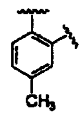
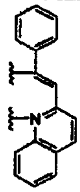
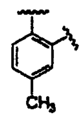
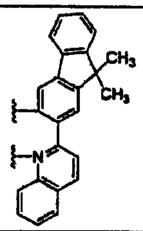
732	H	H	H	H	H	-C(CH3)3			2
733	H	H	H	H	H	-C(CH3)3			2
734	H	H	H	H	H	-C(CH3)3			2
735	H	H	H	H	H	-C(CH3)3			2
736	H	H	H	H	H	-C(CH3)3			2
737	H	H	H	H	H	-C(CH3)3			2
738	H	H	H	H	H	-C(CH3)3			2

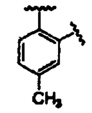
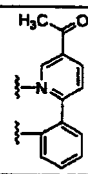
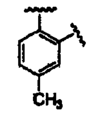
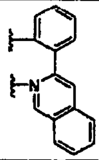
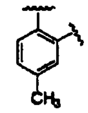
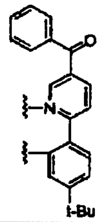
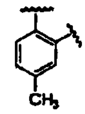
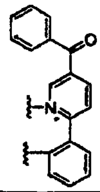
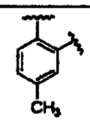
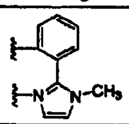
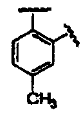
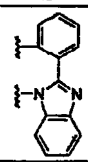
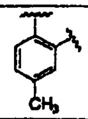
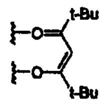
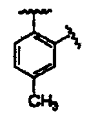
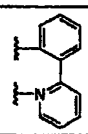
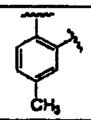
739	H	H	H	H	H	-C(CH3)3			2
740	H	H	H	H	H	-C(CH3)3			2
741	H	H	H	H	H	-C(CH3)3			2
742	H	H	H	H	H	-C(CH3)3			2
743	H	H	H	H	H	-C(CH3)3			2
744	H	H	H	H	H	-C(CH3)3			2
745	H	H	H	H	H	-C(CH3)3			2
746	H	H	H	H	H	-C(CH3)3			2
747	H	H	H	H	H	-C(CH3)3			2
748	H	H	H	H	H	-C(CH3)3			2
749	H	H	H	H	H	-C(CH3)3			2

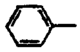
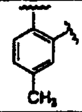
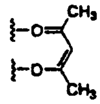
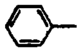
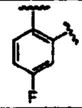
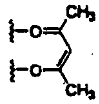
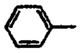
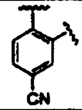
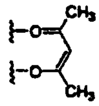
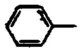
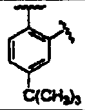
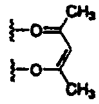
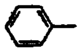
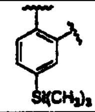
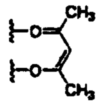
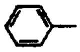
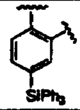
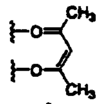
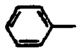
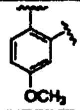
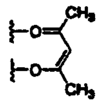
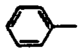
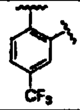
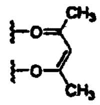
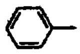
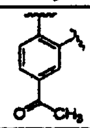
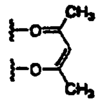
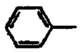
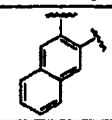
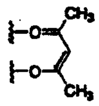
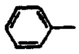
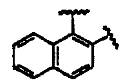
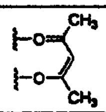
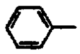
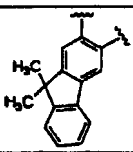
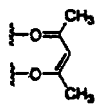
750	H	H	H	H	H	$-C(CH_3)_3$			2
751	H	H	H	H	H	$-C(CH_3)_3$			2
752	H	H	H	H	H	$-C(CH_3)_3$			2
753	H	H	H	H	H	$-C(CH_3)_3$			2
754	H	H	H	H	H	$-C(CH_3)_3$			2
755	H	H	H	H	H	$-C(CH_3)_3$			2
756	H	H	H	H	H	$-C(CH_3)_3$			2
757	H	H	H	H	H	$-C(CH_3)_3$			2
758	H	H	H	H	H	$-C(CH_3)_3$			2
759	H	H	H	H	H	$-C(CH_3)_3$			2

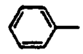
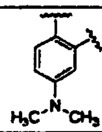
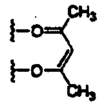
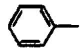
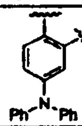
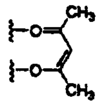
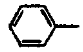
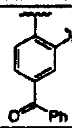
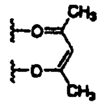
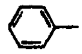
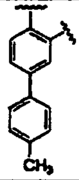
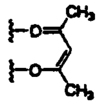
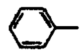
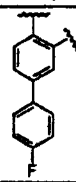
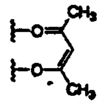
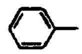
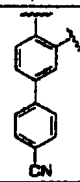
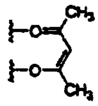
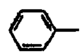
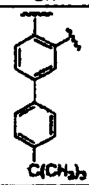
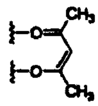
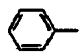
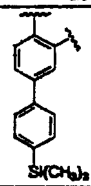
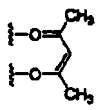
760	H	H	H	H	H	-C(CH₃)₃			2
761	H	H	H	H	H	-C(CH₃)₃			2
762	H	H	H	H	H	-C(CH₃)₃			2
763	H	H	H	H	H	-C(CH₃)₃			2
764	H	H	H	H	H	-C(CH₃)₃			2
765	H	H	H	H	H	-C(CH₃)₃			2
766	H	H	H	H	H	-C(CH₃)₃			2
767	H	H	H	H	H	-C(CH₃)₃			2
768	H	H	H	H	H	-C(CH₃)₃			2
769	H	H	H	H	H	-C(CH₃)₃			2

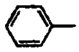
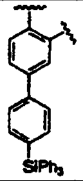
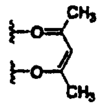
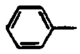
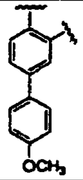
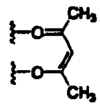
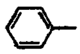
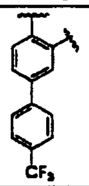
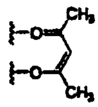
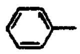
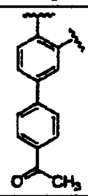
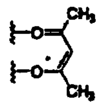
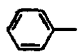
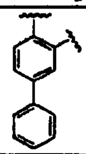
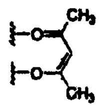
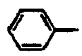
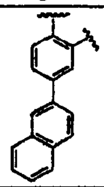
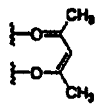
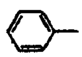
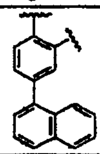
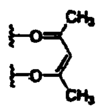
770	H	H	H	H	H	$-C(CH_3)_3$			2
771	H	H	H	H	H	$-C(CH_3)_3$			2
772	H	H	H	H	H	$-C(CH_3)_3$			2
773	H	H	H	H	H	$-C(CH_3)_3$			2
774	H	H	H	H	H	$-C(CH_3)_3$			2
775	H	H	H	H	H	$-C(CH_3)_3$			2
776	H	H	H	H	H	$-C(CH_3)_3$			2
777	H	H	H	H	H	$-C(CH_3)_3$			2

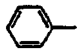
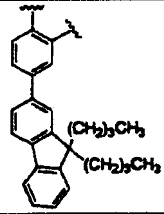
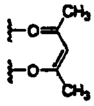
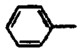
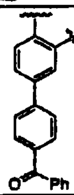
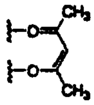
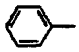
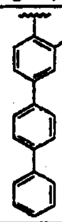
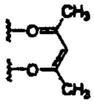
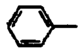
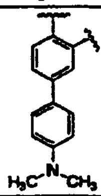
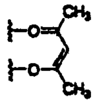
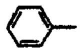
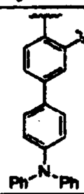
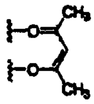
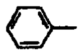
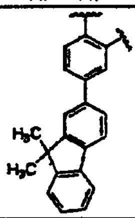
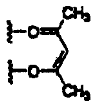
778	H	H	H	H	H	$-C(CH_3)_3$			2
779	H	H	H	H	H	$-C(CH_3)_3$			2
780	H	H	H	H	H	$-C(CH_3)_3$			2
781	H	H	H	H	H	$-C(CH_3)_3$			2
782	H	H	H	H	H	$-C(CH_3)_3$			2
783	H	H	H	H	H	$-C(CH_3)_3$			2
784	H	H	H	H	H	$-C(CH_3)_3$			2

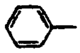
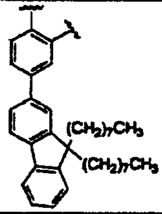
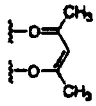
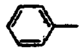
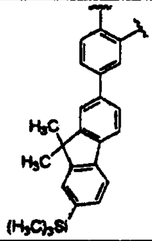
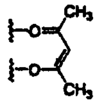
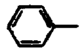
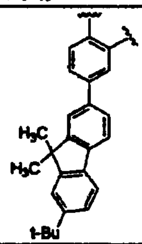
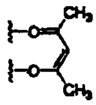
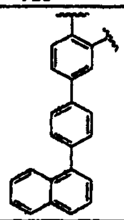
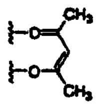
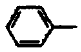
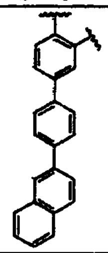
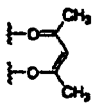
785	H	H	H	H	H	$-C(CH_3)_3$			2
786	H	H	H	H	H	$-C(CH_3)_3$			2
787	H	H	H	H	H	$-C(CH_3)_3$			2
788	H	H	H	H	H	$-C(CH_3)_3$			2
789	H	H	H	H	H	$-C(CH_3)_3$			2
790	H	H	H	H	H	$-C(CH_3)_3$			2
791	H	H	H	H	H	$-C(CH_3)_3$			2
792	H	H	H	H	H	$-C(CH_3)_3$			1
793	H	H	H	H	H	$-C(CH_3)_3$		-	3

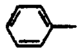
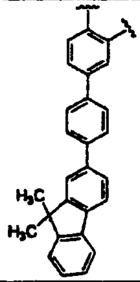
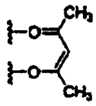
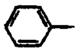
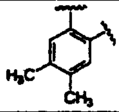
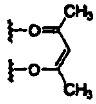
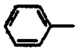
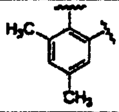
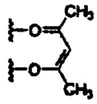
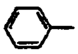
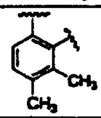
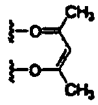
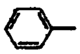
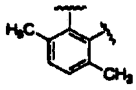
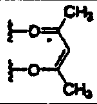
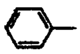
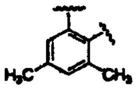
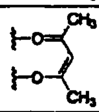
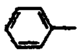
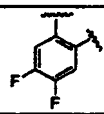
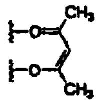
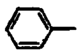
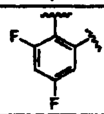
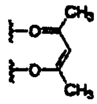
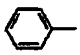
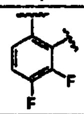
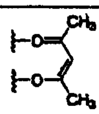
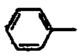
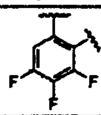
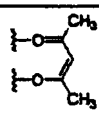
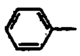
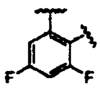
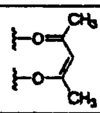
794	H	H	H	H	H				2
795	H	H	H	H	H				2
796	H	H	H	H	H				2
797	H	H	H	H	H				2
798	H	H	H	H	H				2
799	H	H	H	H	H				2
800	H	H	H	H	H				2
801	H	H	H	H	H				2
802	H	H	H	H	H				2
803	H	H	H	H	H				2
804	H	H	H	H	H				2
805	H	H	H	H	H				2

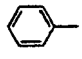
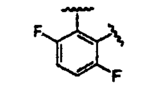
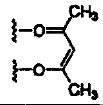
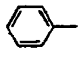
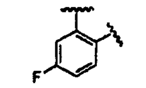
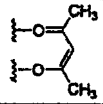
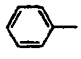
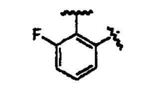
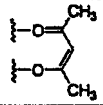
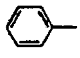
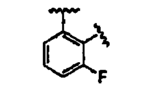
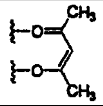
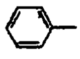
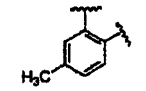
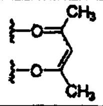
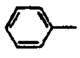
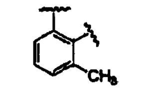
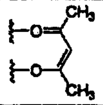
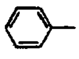
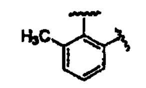
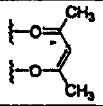
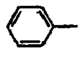
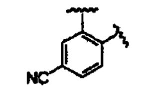
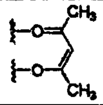
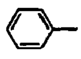
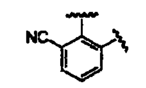
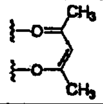
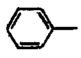
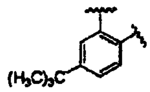
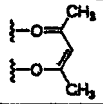
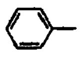
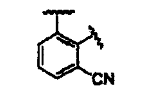
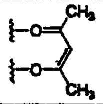
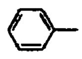
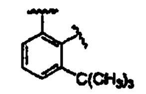
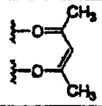
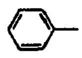
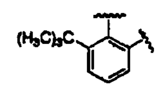
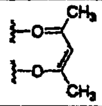
806	H	H	H	H	H				2
807	H	H	H	H	H				2
808	H	H	H	H	H				2
809	H	H	H	H	H				2
810	H	H	H	H	H				2
811	H	H	H	H	H				2
812	H	H	H	H	H				2
813	H	H	H	H	H				2

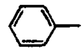
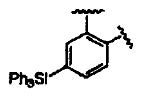
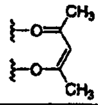
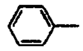
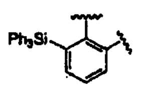
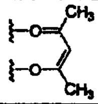
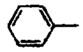
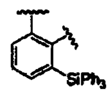
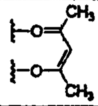
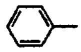
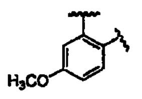
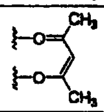
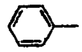
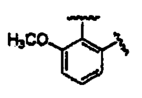
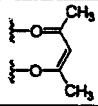
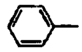
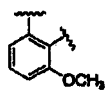
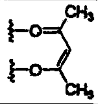
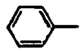
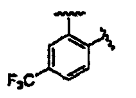
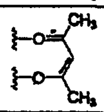
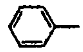
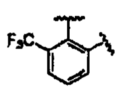
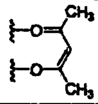
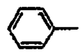
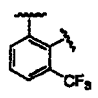
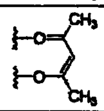
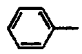
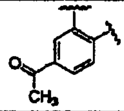
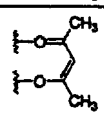
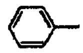
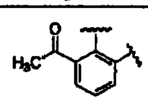
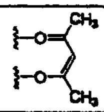
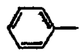
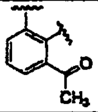
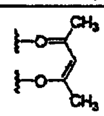
814	H	H	H	H	H				2
815	H	H	H	H	H				2
816	H	H	H	H	H				2
817	H	H	H	H	H				2
818	H	H	H	H	H				2
819	H	H	H	H	H				2
820	H	H	H	H	H				2

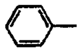
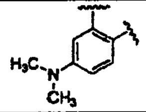
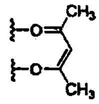
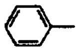
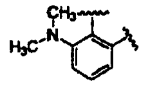
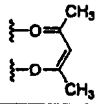
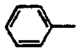
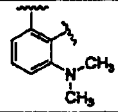
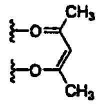
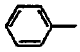
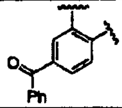
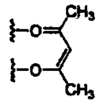
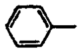
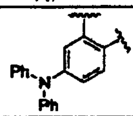
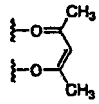
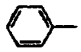
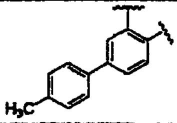
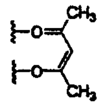
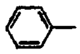
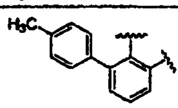
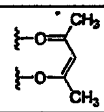
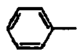
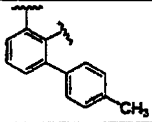
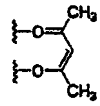
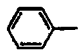
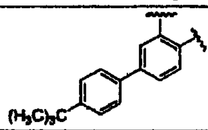
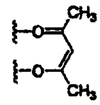
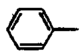
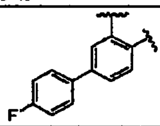
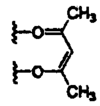
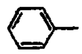
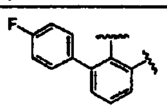
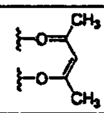
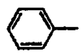
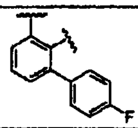
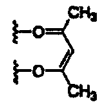
821	H	H	H	H	H				2
822	H	H	H	H	H				2
823	H	H	H	H	H				2
824	H	H	H	H	H				2
825	H	H	H	H	H				2
826	H	H	H	H	H				2

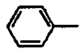
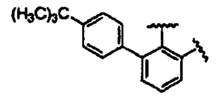
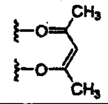
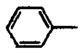
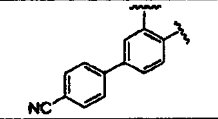
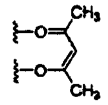
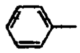
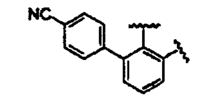
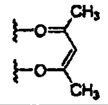
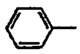
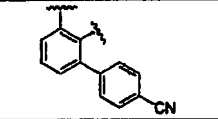
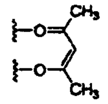
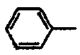
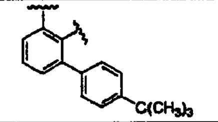
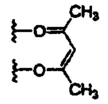
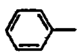
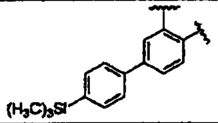
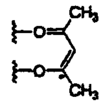
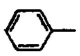
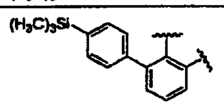
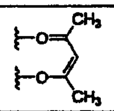
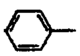
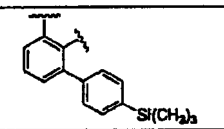
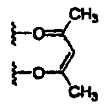
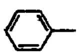
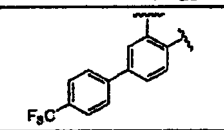
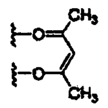
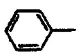
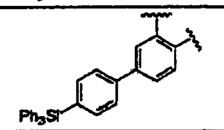
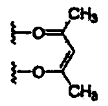
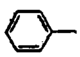
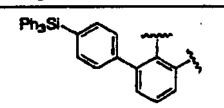
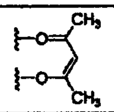
827	H	H	H	H	H				2
828	H	H	H	H	H				2
829	H	H	H	H	H				2
830	H	H	H	H	H				2
831	H	H	H	H	H				2

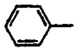
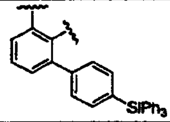
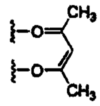
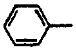
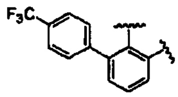
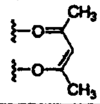
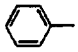
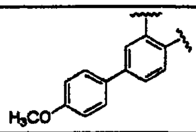
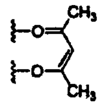
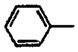
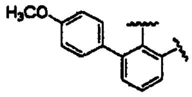
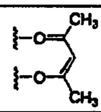
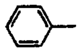
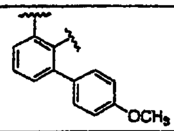
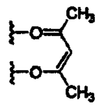
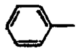
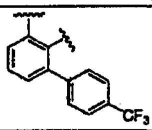
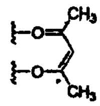
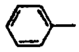
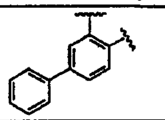
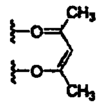
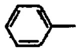
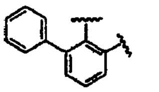
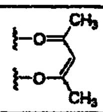
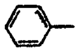
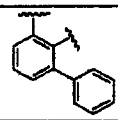
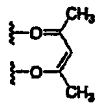
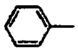
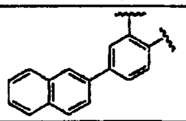
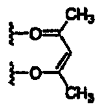
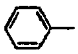
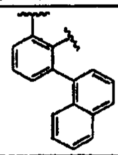
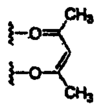
832	H	H	H	H	H				2
833	H	H	H	H	H				2
834	H	H	H	H	H				2
835	H	H	H	H	H				2
836	H	H	H	H	H				2
837	H	H	H	H	H				2
838	H	H	H	H	H				2
839	H	H	H	H	H				2
840	H	H	H	H	H				2
841	H	H	H	H	H				2
842	H	H	H	H	H				2

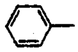
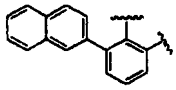
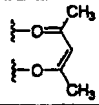
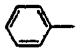
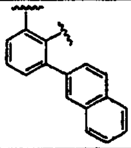
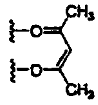
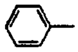
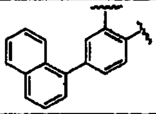
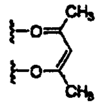
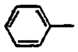
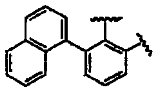
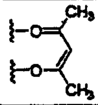
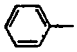
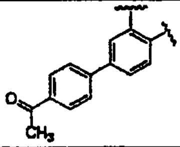
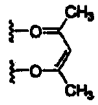
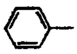
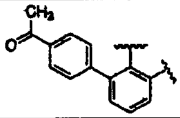
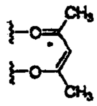
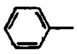
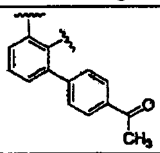
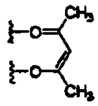
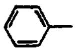
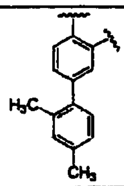
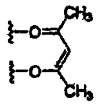
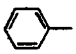
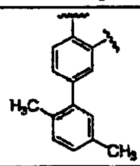
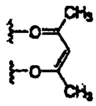
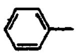
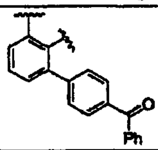
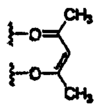
843	H	H	H	H	H				2
844	H	H	H	H	H				2
845	H	H	H	H	H				2
846	H	H	H	H	H				2
847	H	H	H	H	H				2
848	H	H	H	H	H				2
849	H	H	H	H	H				2
850	H	H	H	H	H				2
851	H	H	H	H	H				2
852	H	H	H	H	H				2
853	H	H	H	H	H				2
854	H	H	H	H	H				2
855	H	H	H	H	H				2

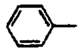
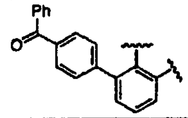
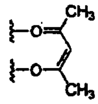
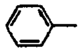
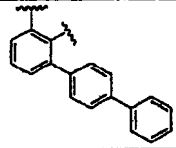
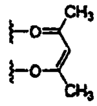
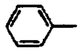
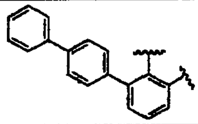
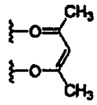
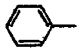
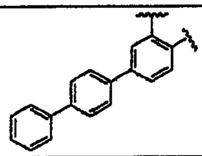
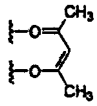
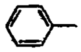
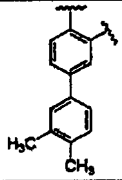
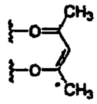
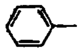
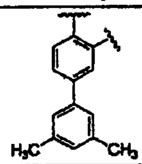
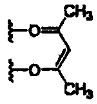
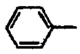
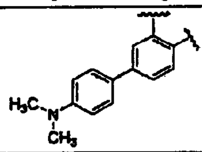
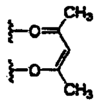
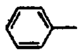
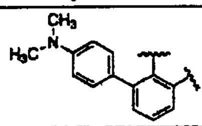
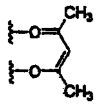
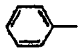
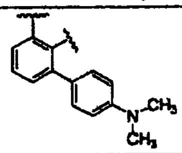
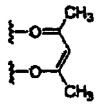
856	H	H	H	H	H				2
857	H	H	H	H	H				2
858	H	H	H	H	H				2
859	H	H	H	H	H				2
860	H	H	H	H	H				2
861	H	H	H	H	H				2
862	H	H	H	H	H				2
863	H	H	H	H	H				2
864	H	H	H	H	H				2
865	H	H	H	H	H				2
866	H	H	H	H	H				2
867	H	H	H	H	H				2

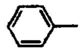
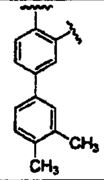
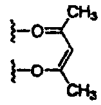
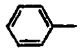
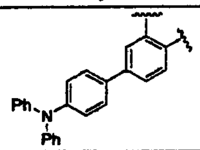
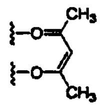
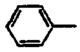
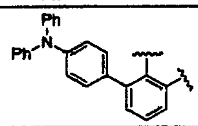
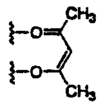
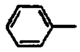
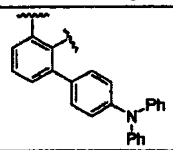
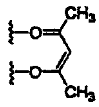
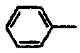
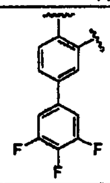
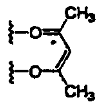
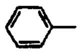
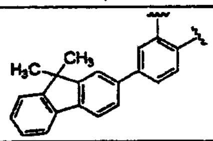
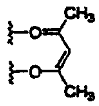
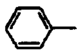
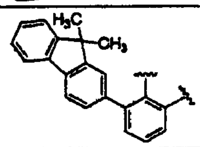
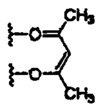
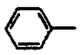
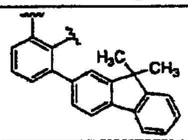
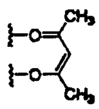
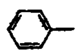
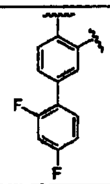
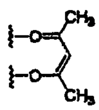
868	H	H	H	H	H				2
869	H	H	H	H	H				2
870	H	H	H	H	H				2
871	H	H	H	H	H				2
872	H	H	H	H	H				2
873	H	H	H	H	H				2
874	H	H	H	H	H				2
875	H	H	H	H	H				2
876	H	H	H	H	H				2
877	H	H	H	H	H				2
878	H	H	H	H	H				2
879	H	H	H	H	H				2

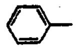
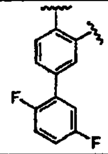
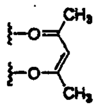
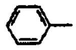
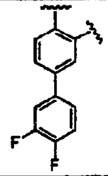
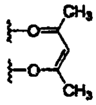
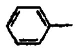
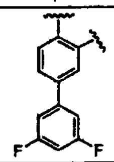
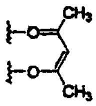
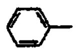
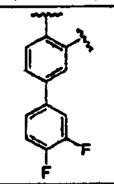
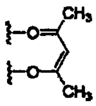
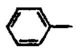
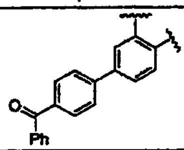
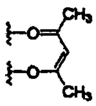
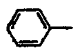
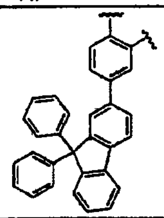
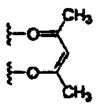
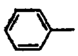
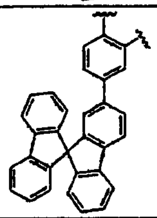
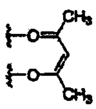
880	H	H	H	H	H				2
881	H	H	H	H	H				2
882	H	H	H	H	H				2
883	H	H	H	H	H				2
884	H	H	H	H	H				2
885	H	H	H	H	H				2
886	H	H	H	H	H				2
887	H	H	H	H	H				2
888	H	H	H	H	H				2
889	H	H	H	H	H				2
890	H	H	H	H	H				2

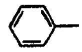
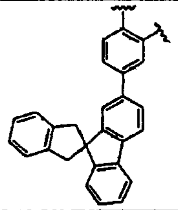
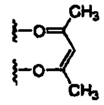
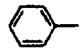
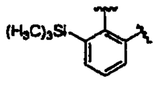
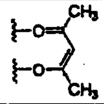
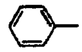
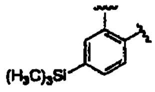
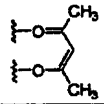
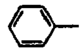
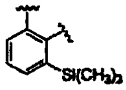
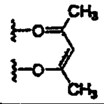
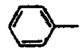
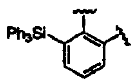
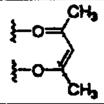
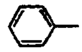
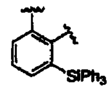
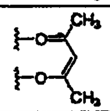
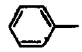
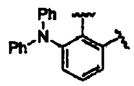
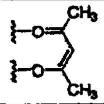
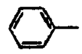
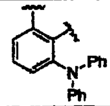
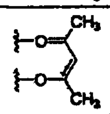
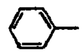
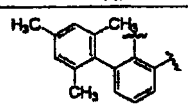
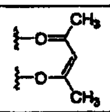
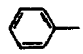
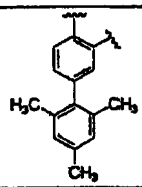
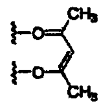
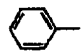
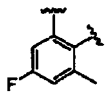
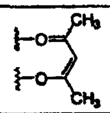
891	H	H	H	H	H				2
892	H	H	H	H	H				2
893	H	H	H	H	H				2
894	H	H	H	H	H				2
895	H	H	H	H	H				2
896	H	H	H	H	H				2
897	H	H	H	H	H				2
898	H	H	H	H	H				2
899	H	H	H	H	H				2
900	H	H	H	H	H				2
901	H	H	H	H	H				2

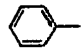
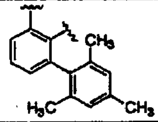
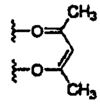
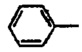
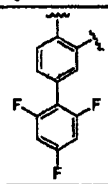
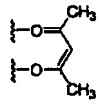
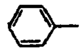
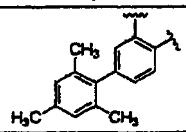
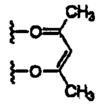
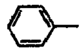
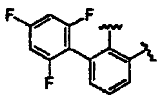
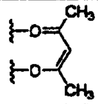
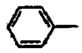
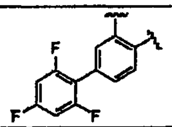
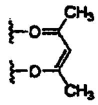
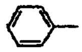
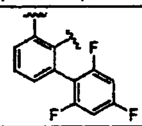
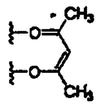
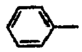
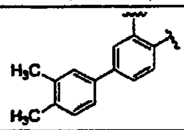
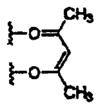
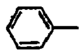
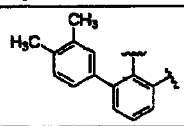
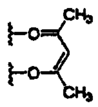
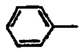
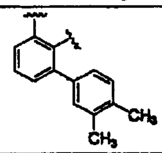
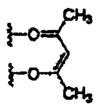
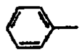
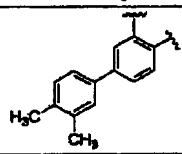
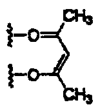
902	H	H	H	H	H				2
903	H	H	H	H	H				2
904	H	H	H	H	H				2
905	H	H	H	H	H				2
906	H	H	H	H	H				2
907	H	H	H	H	H				2
908	H	H	H	H	H				2
909	H	H	H	H	H				2
910	H	H	H	H	H				2
911	H	H	H	H	H				2

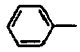
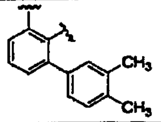
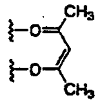
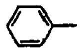
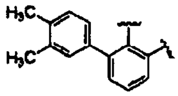
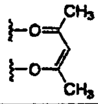
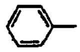
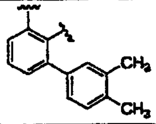
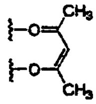
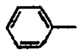
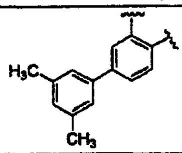
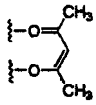
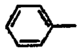
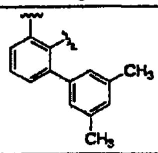
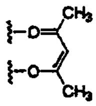
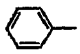
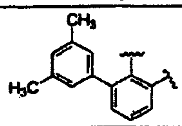
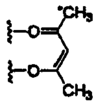
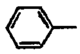
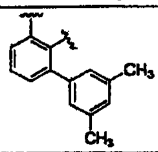
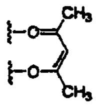
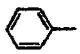
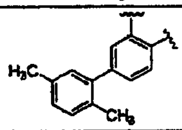
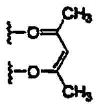
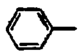
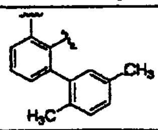
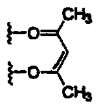
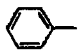
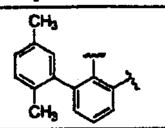
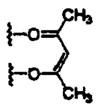
912	H	H	H	H	H				2
913	H	H	H	H	H				2
914	H	H	H	H	H				2
915	H	H	H	H	H				2
916	H	H	H	H	H				2
917	H	H	H	H	H				2
918	H	H	H	H	H				2
919	H	H	H	H	H				2
920	H	H	H	H	H				2

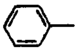
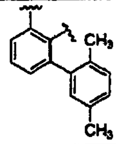
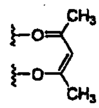
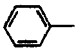
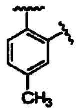
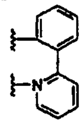
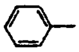
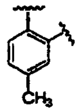
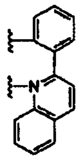
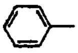
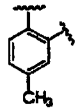
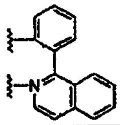
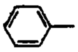
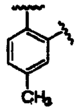
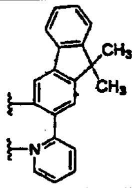
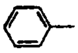
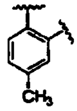
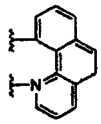
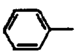
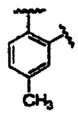
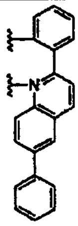
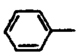
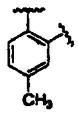
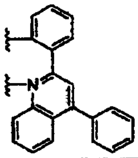
921	H	H	H	H	H				2
922	H	H	H	H	H				2
923	H	H	H	H	H				2
924	H	H	H	H	H				2
925	H	H	H	H	H				2
926	H	H	H	H	H				2
927	H	H	H	H	H				2
928	H	H	H	H	H				2
929	H	H	H	H	H				2

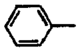
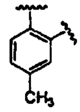
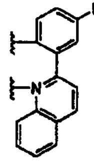
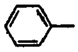
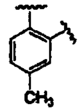
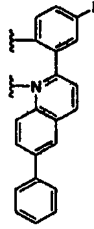
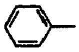
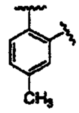
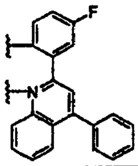
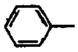
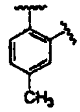
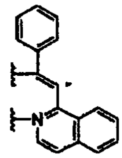
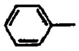
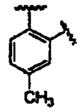
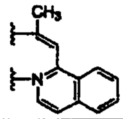
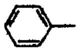
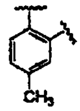
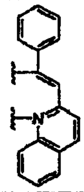
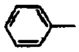
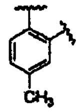
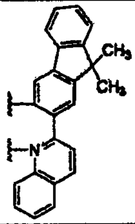
930	H	H	H	H	H				2
931	H	H	H	H	H				2
932	H	H	H	H	H				2
933	H	H	H	H	H				2
934	H	H	H	H	H				2
935	H	H	H	H	H				2
936	H	H	H	H	H				2

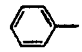
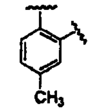
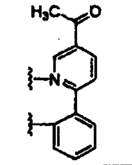
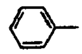
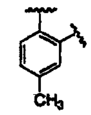
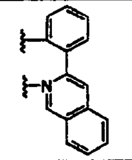
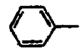
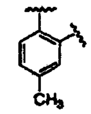
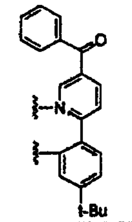
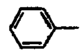
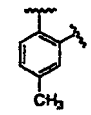
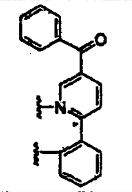
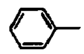
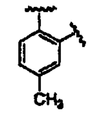
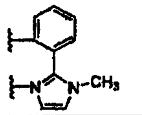
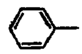
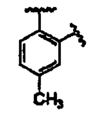
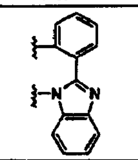
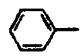
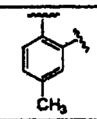
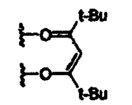
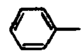
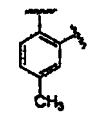
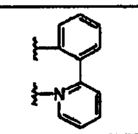
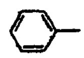
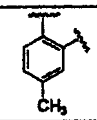
937	H	H	H	H	H				2
938	H	H	H	H	H				2
939	H	H	H	H	H				2
940	H	H	H	H	H				2
941	H	H	H	H	H				2
942	H	H	H	H	H				2
943	H	H	H	H	H				2
944	H	H	H	H	H				2
945	H	H	H	H	H				2
946	H	H	H	H	H				2
947	H	H	H	H	H				2

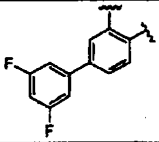
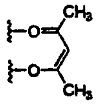
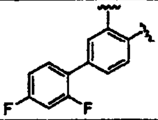
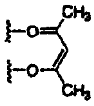
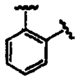
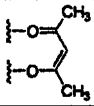
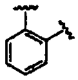
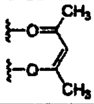
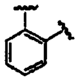
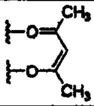
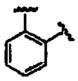
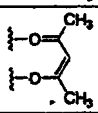
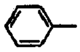
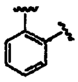
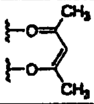
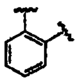
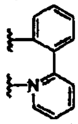
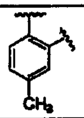
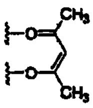
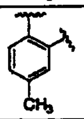
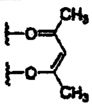
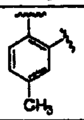
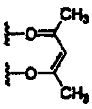
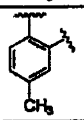
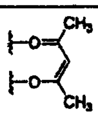
948	H	H	H	H	H				2
949	H	H	H	H	H				2
950	H	H	H	H	H				2
951	H	H	H	H	H				2
952	H	H	H	H	H				2
953	H	H	H	H	H				2
954	H	H	H	H	H				2
955	H	H	H	H	H				2
956	H	H	H	H	H				2
957	H	H	H	H	H				2

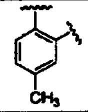
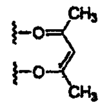
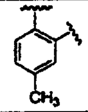
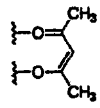
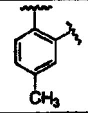
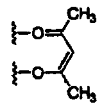
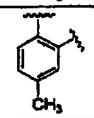
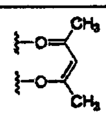
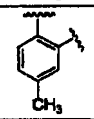
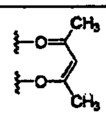
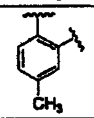
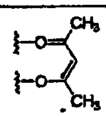
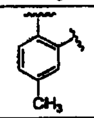
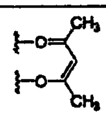
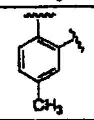
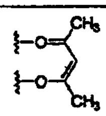
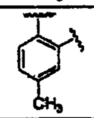
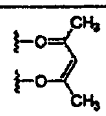
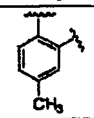
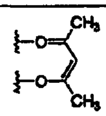
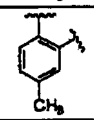
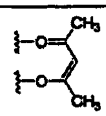
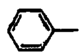
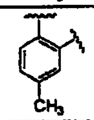
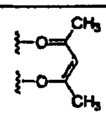
958	H	H	H	H	H				2
959	H	H	H	H	H				2
960	H	H	H	H	H				2
961	H	H	H	H	H				2
962	H	H	H	H	H				2
963	H	H	H	H	H				2
964	H	H	H	H	H				2
965	H	H	H	H	H				2
966	H	H	H	H	H				2
967	H	H	H	H	H				2

968	H	H	H	H	H				2
969	H	H	H	H	H				2
970	H	H	H	H	H				2
971	H	H	H	H	H				2
972	H	H	H	H	H				2
973	H	H	H	H	H				2
974	H	H	H	H	H				2
975	H	H	H	H	H				2

976	H	H	H	H	H				2
977	H	H	H	H	H				2
978	H	H	H	H	H				2
979	H	H	H	H	H				2
980	H	H	H	H	H				2
981	H	H	H	H	H				2
982	H	H	H	H	H				2

983	H	H	H	H	H				2
984	H	H	H	H	H				2
985	H	H	H	H	H				2
986	H	H	H	H	H				2
987	H	H	H	H	H				2
988	H	H	H	H	H				2
989	H	H	H	H	H				2
990	H	H	H	H	H				1
991	H	H	H	H	H			–	3

992	H	H	H	H	H	H			2
993	H	H	H	H	H	H			2
994	H	H	H	H	H	H			2
995	H	H	H	H	H	F			2
996	H	H	H	H	H	$-CH_3$			2
997	H	H	H	H	H	$-C(CH_3)_3$			2
998	H	H	H	H	H				2
999	H	H	H	H	H	H			2
1000	$-CH_3$	H	H	H	H	H			2
1001	H	$-CH_3$	H	H	H	H			2
1002	H	H	$-CH_3$	H	H	H			2
1003	H	H	H	$-CH_3$	H	H			2

1004	H	H	H	H	-CH₃	H			2
1005	-CH₃	H	H	H	H	F			2
1006	H	-CH₃	H	H	H	F			2
1007	H	H	-CH₃	H	H	F			2
1008	H	H	H	-CH₃	H	F			2
1009	H	H	H	H	-CH₃	F			2
1010	-CH₃	H	H	H	H	-CH₃			2
1011	H	-CH₃	H	H	H	-CH₃			2
1012	H	H	-CH₃	H	H	-CH₃			2
1013	H	H	H	-CH₃	H	-CH₃			2
1014	H	H	H	H	-CH₃	-CH₃			2
1015	-CH₃	H	H	H	H				2

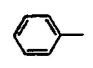
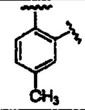
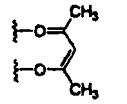
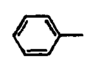
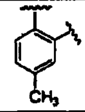
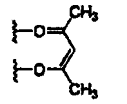
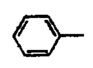
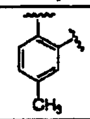
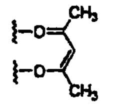
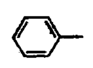
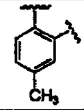
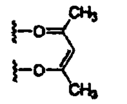
1016	H	$-CH_3$	H	H	H				2
1017	H	H	$-CH_3$	H	H				2
1018	H	H	H	$-CH_3$	H				2
1019	H	H	H	H	$-CH_3$				2

表 2

化合物編號	^1H NMR($CDCl_3$, 200 MHz)	MS/FAB	
		實測值	計算值
11	δ = 8.6(d, 2H), 8.0 (m, 2H), 7.7-7.6 (m, 14H), 7.4-7.3 (m, 14H), 1.71 (s, 3H), 1.31 (s, 3H)	623	624.15
83	δ = 8,2 (s, 2H), 8.1 (d, 2H), 7.7 (m, 10H), 7.4 (m, 20H), 1.71 (s, 3H). 1.33 (s, 9H), 1.31 (s, 3H)	703	704.21
84	δ = 8,2 (s, 2H), 8.0 (m, 2H), 7.7-7.6 (m, 10H), 7.5-7.3 (m, 16H), 7.1 (m, 4H), 1.71 (s, 3H). 1.31 (s, 3H)	667	668.16
104	δ = 8,2 (s, 2H), 8.1 (d, 2H), 7.7 (m, 14H), 7.4 (m, 18H), 1.71 (s, 3H). 1.31 (s, 3H) (m, 2H). 7.03 (m, 4H), 5.7 (s, 1H), 1.71 (s, 3H). 1.31(s, 3H)	647	648.15
133	δ = 8,2 (s, 2H), 8.0 (m, 4H), 7.8-7.4 (m, 32H), 7.3 (m, 2H), 1.71 (s, 3H). 1.67 (s, 6H), 1.31 (s, 3H)	765	766.23
302	δ = 8,2 (s, 2H), 8.0 (m, 2H), 7.7-7.6 (m, 10H), 7.4 (m, 16H), 7.1 (m, 4H), 1.71 (s, 3H). 1.31 (s, 3H)	667	668.16
699	δ = 8,2 (s, 2H), 8.0 (m, 2H), 7.7-7.6 (m, 10H), 7.4-7.3 (m, 20H), 1.71 (s, 3H). 1.33 (s, 9H), 1.31 (s, 3H)	705	706.23
897	δ = 8,2 (s, 2H), 8.0 (m, 2H), 7.7-7.6 (m, 14H), 7.5-7.4 (m, 18H), 7.2 (m, 8H), 1.71 (s, 3H), 1.31 (s, 3H)	725	726.20

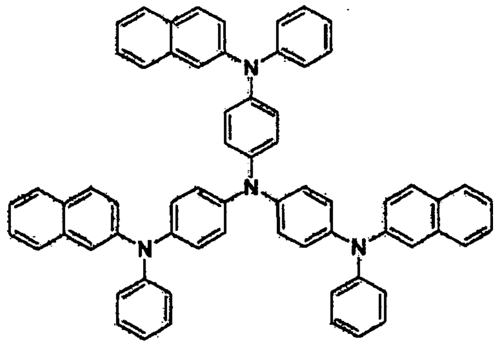
[實施例 1] OLED(1)之製造

經由使用根據本發明之有機電場發光化合物製造 OLED 裝置。

首先，使用超音波而依序以三氯乙烯、丙酮、乙醇以及蒸餾水清洗自 OLED 用玻璃(由 Samsung Corning 製造)(1)所製得之透明電極 ITO 薄膜(15Ω/□)(2)，並儲存於異丙

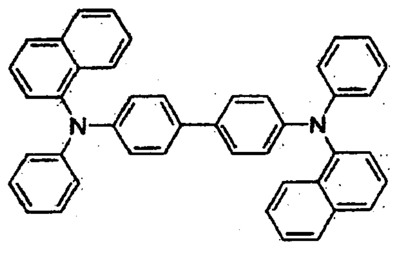
醇中備用。

接著，接著，將 ITO 基板裝配於真空氣相沉積裝置之基板夾中，且將，並且將 4,4’,4”-參(N,N-(2-萘基)-苯基胺基)三苯基胺(2-TNATA)置於真空氣相沉積裝置之小室(cell)中，接著於氣室中通風至 10^{-6} 托(torr)之真空。施加電流至小室來揮發 2-TNATA，藉以在 ITO 基板上提供具有 60 奈米(nm)厚度之電洞注入層(3)的氣相沉積。



2-TNATA

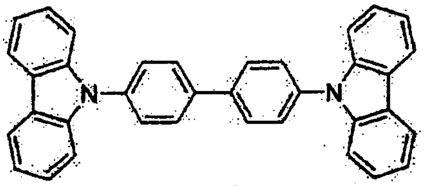
接著，於真空氣相沉積裝置之另一個小室中填入 N,N’-雙(α-萘基)-N,N’-二苯基-4,4’-二胺(NPB)，並且施加電流至該小室來揮發 NPB，藉以在於電洞注入層上提供具有 20 nm 厚度之電洞傳輸層(4)的氣相沉積物。



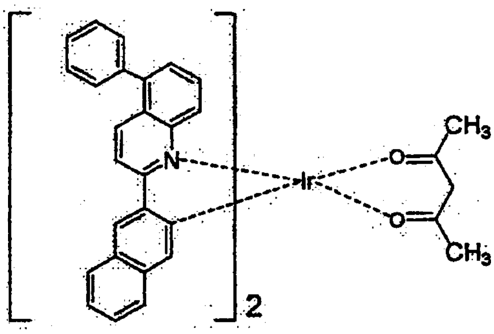
NPB

在真空氣相沉積裝置之另一個小室中填入 4,4’,4”-二咔唑-聯苯(CBP)作為電場發光主體材料，並且將根據本發明之有機電場發光化合物(化合物 10)填入至又另一個

小室。將此兩種材料以不同速率揮發來進行摻雜以在電洞傳輸層上氣相沉積具有 30 nm 厚度之電場發光層(5)。以 CBP 為基礎計，適當的摻雜濃度為 4 至 10 莫耳%。

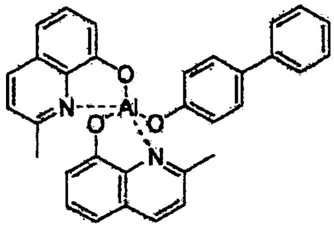


CBP

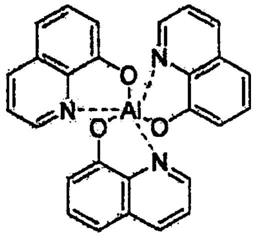


化合物 10

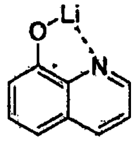
接著，以與用於 NPB 的相同方式，將電場發光層上氣相沉積雙(2-甲基-8-羥基喹啉)(對苯基酚)鋁(III)(bis(2-methyl-8-quinolinato)(p-phenylphenolato) aluminum (III)，BAlq)以作為具有 10 nm 厚度之電洞阻礙層，氣相沉積參(8-羥基喹啉)鋁(III)(Alq)作為具有 20 nm 厚度之電子傳輸層(6)，並且接著氣相沉積喹啉鋰(Liq)以作為具有 1 至 2 nm 厚度之電子注入層(7)。之後，經由使用另一個真空氣相沉積裝置來氣相沉積具有 150nm 厚之 Al 陰極(8)而製造 OLED。



BAlq



Alq



Liq

[實施例 2]OLED(2)之製造

根據實施例 1 之製程形成電洞注入層和電洞傳輸層，

並且根據下述方式氣相沉積電場發光層。在真空氣相沉積裝置之另一個小室中填入 H-2 作為電場發光主體材料之充電，並且將根據本發明之有機電場發光化合物(化合物 199)填入又另一個小室。以不同速率揮發兩種材料來進行摻雜，以在電洞傳輸層上氣相沉積具有 30 nm 厚度之電場發光層(5)。以主體材料為基礎計，適當的摻雜濃度為 4 至 10 莫耳%。接著，根據實施例 1 中的相同製程氣相沉積電洞阻礙層、電子傳輸層以及電子注入層，接著再經由使用另一個真空氣相沉積裝置來氣相沉積具有 150nm 厚之鋁(Al)陰極。

[實施例 3]OLED(3)之製造

根據實施例 2 之相同製程形成電洞注入層、電洞傳輸層與電場發光層，接著氣相沉積電子傳輸層與電子注入層。之後，再藉由使用另一個真空氣相沉積裝置來氣相沉積具有 150nm 厚之鋁(Al)陰極，而製造 OLED。為了確認根據實施例 1 至 3 所製備之 OLED 的效率，以 10 毫安培/平方公分(mA/cm^2)測量 OLED 的發光效率。各種性質顯示於表 3 中。

表 3

	材料	主體材料	電洞阻礙層	EL 顏色	操作電壓	最高發光效率 燭光/安培 (cd/A)
實施例 1	化合物 10	CBP	BAlq	紅	8.1	9.4
	化合物 16	CBP	BAlq	紅	8.2	9.8
	化合物 44	CBP	BAlq	紅	8.0	11.3
	化合物 49	CBP	BAlq	紅	8.2	11.8
	化合物 56	CBP	BAlq	紅	8.0	10.9
	化合物 79	CBP	BAlq	紅	8.3	10.6
	化合物 177	CBP	BAlq	紅	8.1	11.5
	化合物 199	CBP	BAlq	紅	8.3	10.8
	化合物 208	CBP	BAlq	紅	8.4	9.9
	化合物 210	CBP	BAlq	紅	8.2	10.1
	化合物 241	CBP	BAlq	紅	8.0	11.0
	化合物 348	CBP	BAlq	紅	8.2	9.9
	化合物 374	CBP	BAlq	紅	7.9	11.0
	化合物 375	CBP	BAlq	紅	8.0	10.9
	化合物 585	CBP	BAlq	紅	7.9	11.8
	化合物 590	CBP	BAlq	紅	7.8	12.0
	化合物 594	CBP	BAlq	紅	7.9	11.4
	化合物 648	CBP	BAlq	紅	8.2	10.4
	化合物 783	CBP	BAlq	紅	8.0	10.8
	化合物 803	CBP	BAlq	紅	8.4	9.5
	化合物 836	CBP	BAlq	紅	8.3	10.0
	化合物 902	CBP	BAlq	紅	8.1	10..1
	化合物 980	CBP	BAlq	紅	8.0	10.7
實施例 2	化合物 10	H-4	BAlq	紅	7.9	9.5
	化合物 199	H-2	BAlq	紅	8.2	10.6
	化合物 375	H-7	BAlq	紅	8.0	11.0
	化合物 783	H-40	BAlq	紅	7.8	10.9
實施例 3	化合物 49	H-8	-	紅	6.9	11.6
	化合物 375	H-12	-	紅	7.1	11.1
	化合物 783	H-40	-	紅	7.2	10.8
	化合物 980	H-64	-	紅	6.9	10.4

由於甲基影響 HOMO 能階(HOMO level)，發現化合物(44)顯示改良的色座標和加強的效率兩者。化合物(49)(於其中提供 F 給配位子)影響 HOMO 能階，而因此顯示加強的發光效率，雖然色座標比提供 F 前之相同化合物低。對於化合物(177)、(585)以及(590)，則分別併入了 2-苯基喹啉、2-苯乙烯喹啉以及苯基(6-苯基吡啶-3-基)甲酮作為輔助配位子。在根據本發明之化合物中，它們顯示最優良的發光效率(分別為 11.5 cd/A、11.8 cd/A 以及 12.0 cd/A)。至於將 ppy1-苯乙烯喹啉、2-苯基喹啉、2-

苯乙烯喹啉或苯基(6-苯基吡啶-3-基)甲酮併入其中以作為輔助配位子之化合物亦顯示高的發光效能。因此，發現輔助配位子與主要配位子的適當組合於加強化合物之發光效率上扮演重要的角色。

具有完全相同的裝置結構時，在 EL 裝置中使用根據本發明之主體材料來取代 CBP 並不會對效率、色座標以及操作電壓產生顯著變化。因此可預見，彼等主體材料(當根據本發明與摻雜劑一起利用時)可應用來作為磷光主體材料來取代作為傳統電場發光主體材料之 CBP。與使用傳統主體材料者相比，當在沒有使用電洞阻礙層的情況下使用根據本發明之主體材料時，該裝置顯示可媲美的或是更高的發光效率，並因其降低操作電壓至少 0.8V 而使得 OLED 功率消耗減少。若本發明應用於大量製造 OLED，亦可降低大大量製造 OLED 所需時間而得商業化的巨大利益。

【圖式簡單說明】

第 1 圖為 OLED 的截面圖。

【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	電場發光層	6	電子傳輸層
7	電子注入層	8	鋁陰極

200946634

發明專利說明書

（本說明書格式、順序，請勿任意更動，※記號部分請勿填寫）

※申請案號：97142326

※申請日：97.11.3　　　※IPC分類：C09K 11/06(2006.01)

一、發明名稱：(中文/英文)

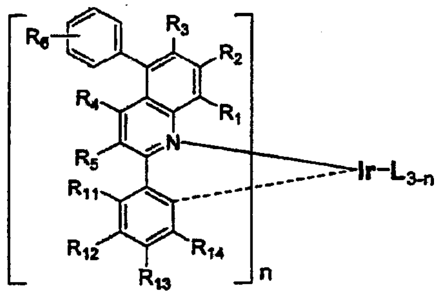
新穎有機電場發光化合物及使用該化合物之有機電場發光裝置

NOVEL ORGANIC ELECTROLUMINESCENT COMPOUNDS AND ORGANIC ELECTROLUMINESCENT DEVICE USING THE SAME

二、中文發明摘要：

本發明係關於顯示高發光效率之新穎有機電場發光化合物及化合包含該化合物之有機電場發光裝置。根據本發明之有機電場發光化合物係以化學式(1)表示

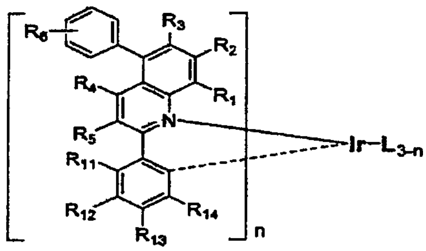
化學式(1)



三、英文發明摘要：

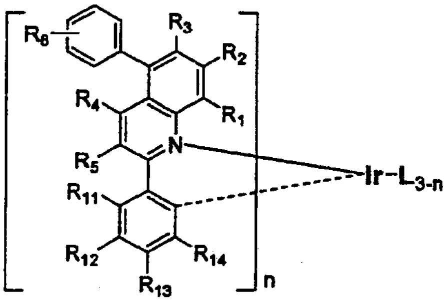
The present invention relates to novel organic electroluminescent compounds exhibiting high luminous efficiency, and organic electroluminescent devices comprising the same. The organic electroluminescent compounds according to the invention are represented by Chemical Formula (1):

Chemical Formula 1



七、申請專利範圍：

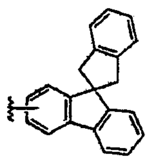
1. 一種由化學式(1)所表示之有機電場發光化合物：



其中，L為有機配位子；

R_1至R_5獨立表示氫、(C_1-C_{60})烷基、(C_1-C_{60})烷氧基、(C_3-C_{60})環烷基、鹵素、三(C_1-C_{60})烷基矽烷基或三(C_6-C_{60})芳基矽烷基；

R_6表示氫、(C_1-C_{60})烷基、鹵素或(C_6-C_{60})芳基；

R_{11}至R_{14}獨立表示氫、(C_1-C_{60})烷基、鹵素、氰、三(C_1-C_{60})烷基矽烷基、三(C_6-C_{60})芳基矽烷基、(C_1-C_{60})烷氧基、(C_1-C_{60})烷基羰基、(C_6-C_{60})芳基羰基、二(C_1-C_{60})烷基胺基、二(C_6-C_{60})芳基胺基、苯基、萘基、蒽基、茀基、螺二茀基或 ，或R_{11}至R_{14}之各者可經由具有或是不具有稠合環之(C_3-C_{12})伸烷基或(C_3-C_{12})伸烯基鏈結至來自R_{11}至R_{14}之另一個相鄰基而形成脂環、或是單環或多環之芳香環；

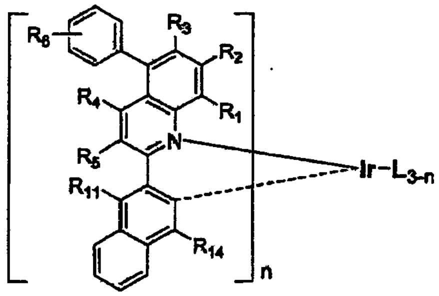
R_{11}至R_{14}的烷基、苯基、萘基、蒽基、茀基，以及經由具有或是不具有稠合環(C_3-C_{12})伸烷基或(C_3-C_{12})

伸烯基鏈結而自彼等基形成之該脂環、或是單環或多環之芳香環可進一步經由一個或多個選自下列之取代基取代：具有或是不具有鹵素取代基的(C_1-C_{60})烷基、(C_1-C_{60})烷氧基、鹵素、三(C_1-C_{60})烷基矽烷基、三(C_6-C_{60})芳基矽烷基、(C_1-C_{60})烷基羰基、(C_6-C_{60})芳基羰基、二(C_1-C_{60})烷基胺基、二(C_6-C_{60})芳基胺基以及(C_6-C_{60})芳基；以及

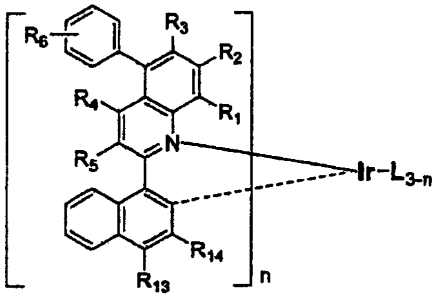
n為1至3之整數。

2. 如申請專利範圍第1項之有機電場發光化合物，其係選自由化學式(2)至(6)之一者所表示之化合物：

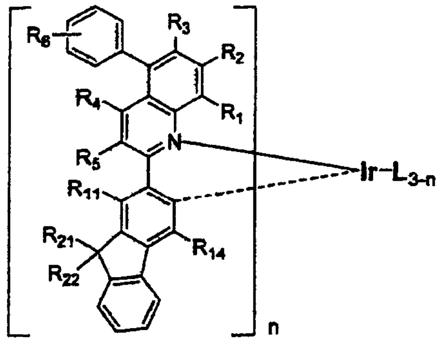
化學式(2)



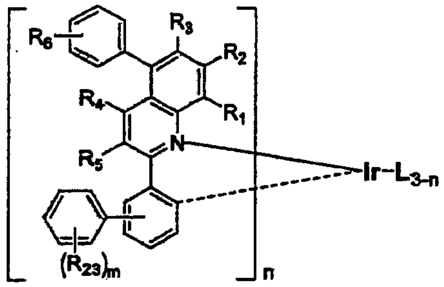
化學式(3)



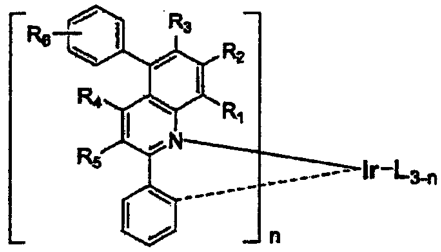
化學式(4)



化學式(5)



化學式(6)



其中，L、R_1、R_2、R_3、R_4、R_5、R_6、R_{11}、R_{13}、R_{14}及n係如申請專利範圍第1項之化學式(1)中之定義；

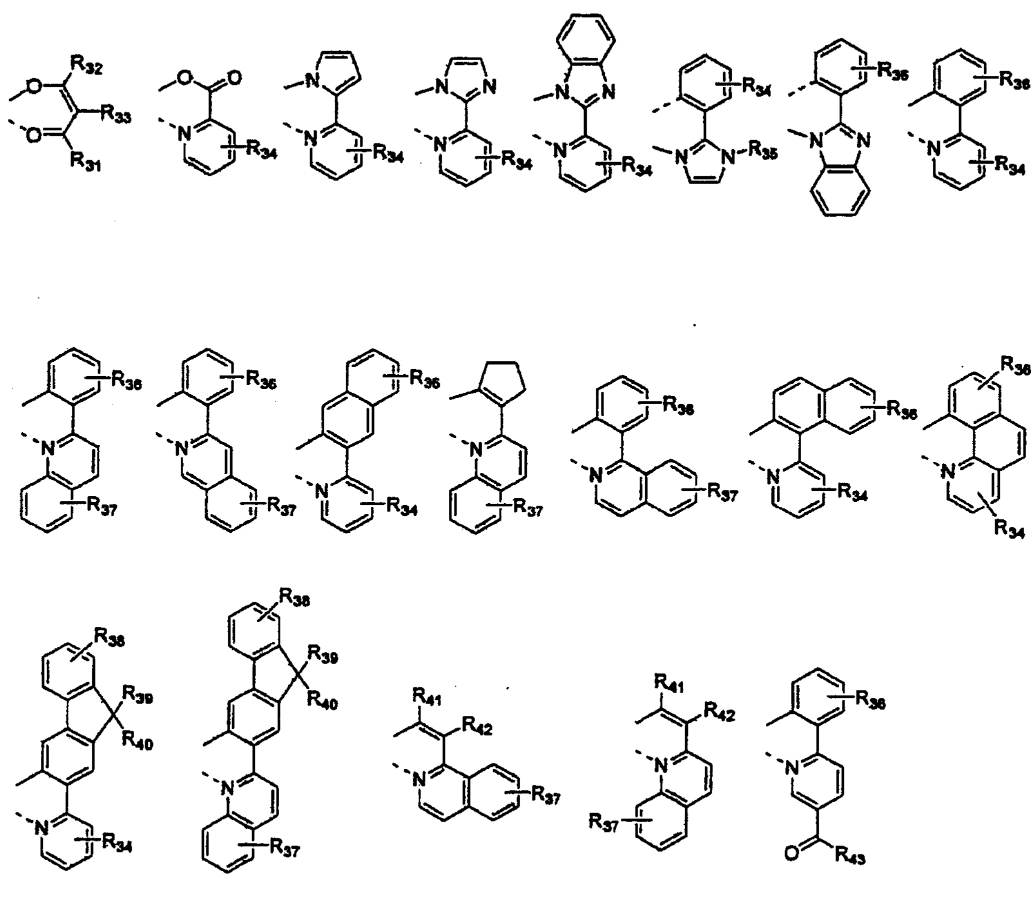
R_{21}與R_{22}獨立表示氫、(C_1-C_{60})烷基、(C_6-C_{60})芳基，或R_{21}與R_{22}可經由具有或是不具有稠合環之(C_3-C_{12})伸烷基或(C_3-C_{12})伸烯基互相鍵結而形成脂環、或是單環或多環之芳香環；

R_{23}表示(C_1-C_{60})烷基、鹵素、氰、三(C_1-C_{60})烷基矽烷基、三(C_6-C_{60})芳基矽烷基、(C_1-C_{60})烷氧基、(C_1-C_{60})烷基羰基、(C_6-C_{60})芳基羰基、苯基、二(C_1-C_{60})烷基胺

基、二(C_6-C_{60})芳基胺基、萘基、9,9-二(C_1-C_{60})烷基茀基或 9,9-二(C_6-C_{60})芳基茀基；以及

m 為 1 至 5 之整數。

3. 如申請專利範圍第 1 項之有機電場發光化合物，其中，該配位子(L)具有下列化學式之一所表示之結構：



其中，R_{31} 與 R_{32} 獨立表示氫、具有或不具有鹵素取代基之(C_1-C_{60})烷基、具有或不具有(C_1-C_{60})烷基取代基之苯基、或鹵素；

R_{33} 至 R_{38} 獨立表示氫、(C_1-C_{60})烷基、具有或不具有(C_1-C_{60})烷基取代基之苯基、三(C_1-C_{60})烷基矽烷基或鹵素；

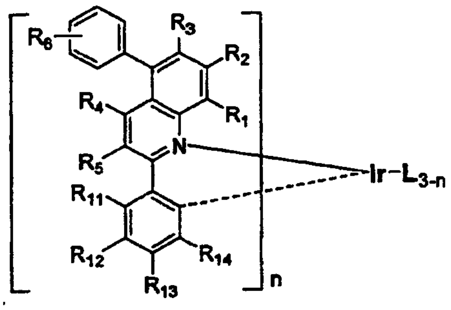
R_{39} 至 R_{42} 獨立表示氫、(C_1-C_{60})烷基、或具有或不具

有(C_1-C_{60})烷基取代基之苯基；以及

R_{43}表示(C_1-C_{60})烷基、具有或不具有 (C_1-C_{60})烷基取代基之苯基、或鹵素。

4. 一種有機電場發光裝置，其係包括第一電極；第二電極；以及插置於該第一電極和該第二電極之間之至少一層有機層；其中，該有機層包括電場發光區域，該電場發光區域包括由化學式(1)所表示之有機電場發光化合物：

化學式(1)

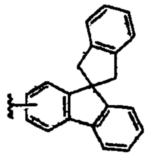


其中，L為有機配位子；

R_1至R_5獨立表示氫、(C_1-C_{60})烷基、(C_1-C_{60})烷氧基、(C_3-C_{60})環烷基、鹵素、三(C_1-C_{60})烷基矽烷基或三(C_6-C_{60})芳基矽烷基；

R_6表示氫、(C_1-C_{60})烷基、鹵素或(C_6-C_{60})芳基；

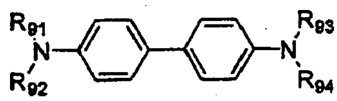
R_{11}至R_{14}獨立表示氫、(C_1-C_{60})烷基、鹵素、氰、三(C_1-C_{60})烷基矽烷基、三(C_6-C_{60})芳基矽烷基、(C_1-C_{60})烷氧基、(C_1-C_{60})烷基羰基、(C_6-C_{20})芳基羰基、二(C_1-C_{60})烷基胺基、二(C_6-C_{60})芳基胺基、苯基、萘基、蒽基、

茀基、螺二茀基或 ，或 R_{11} 至 R_{14} 之各者可經由具有或是不具有稠合環之(C_3-C_{12})伸烷基或(C_3-C_{12})伸烯基鏈結至來自 R_{11} 至 R_{14} 之另一個相鄰基而形成脂環、或是單環或多環之芳香環；

R_{11} 至 R_{14} 的烷基、苯基、萘基、蒽基、茀基，以及經由具有或是不具有稠合環之(C_3-C_{12})伸烷基或(C_3-C_{12})伸烯基鏈結而自彼等基形成之該脂環、或是單環或多環之芳香環可進一步經由一個或多個選自下列各者之取代基取代：具有或是不具有鹵素取代基之(C_1-C_{60})烷基、(C_1-C_{60})烷氧基、鹵素、三(C_1-C_{60})烷基矽烷基、三(C_6-C_{60})芳基矽烷基、(C_1-C_{60})烷基羰基、(C_6-C_{60})芳基羰基、二(C_1-C_{60})烷基胺基、二(C_6-C_{60})芳基胺基以及(C_6-C_{60})芳基；以及

n 為 1 至 3 之整數，以及該電場發光區域包括一種或多種選自 1,3,5-三咔唑基苯、聚乙烯基咔唑、間-雙咔唑基苯基、4,4’,4”-三(N-咔唑基)三苯胺、1,3,5-三(2-咔唑基苯基)苯、1,3,5-參(2-咔唑基-5-甲氧基苯基)苯、雙(4-咔唑基苯基)矽烷以及由化學式(6)至(9)之一者所表示之化合物：

化學式(6)

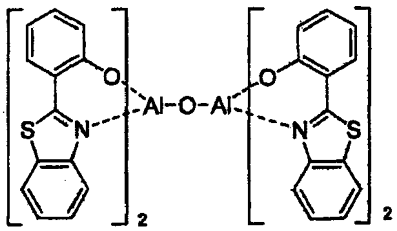


在化學式(6)中，R_{91}至R_{94}獨立表示氫、鹵素、(C_1-C_{60})烷基、(C_6-C_{60})芳基、(C_4-C_{60})雜芳基、含有一個或多個選自N、O及S之雜原子之5-或6-員雜環烷基、(C_3-C_{60})環烷基、三(C_1-C_{60})烷基矽烷基、二(C_1-C_{60})烷基(C_6-C_{60})芳基矽烷基、三(C_6-C_{60})芳基矽烷基、金剛烷基、(C_7-C_{60})雙環烷基、(C_2-C_{60})烯基、(C_2-C_{60})炔基、氰、(C_1-C_{60})烷基胺基、(C_6-C_{60})芳基胺基、(C_6-C_{60})芳基(C_1-C_{60})烷基、(C_1-C_{60})烷氧基、(C_1-C_{60})烷硫基、(C_6-C_{60})芳氧基、(C_6-C_{60})芳硫基、(C_1-C_{60})烷氧基羰基、(C_1-C_{60})烷基羰基、(C_6-C_{60})芳基羰基、羧基、硝基或羥基，或R_{91}至R_{94}之各者可經由具有或是不具有稠合環之(C_3-C_{60})伸烷基或(C_3-C_{60})伸烯基鏈結至另一個相鄰取代基而形成脂環、或是單環或多環之芳香環；

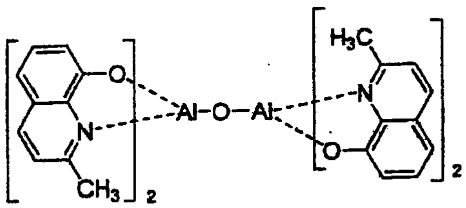
R_{91}至R_{94}之烷基、烯基、炔基、環烷基、雜環烷基、芳基、雜芳基、芳基矽烷基、烷基矽烷基、烷基胺基、或芳基胺基、或是R_{91}至R_{94}經由具有或是不具有稠合環之(C_3-C_{60})伸烷基或(C_3-C_{60})伸烯基鏈結至一相鄰取代基所形成的該脂環、或單環或多環之芳香環可進一步經由一個或多個選自下列之取代基取代：鹵素、(C_1-C_{60})烷基、(C_6-C_{60})芳基、(C_4-C_{60})雜芳基、含有一個或多個選自N、O以及S之雜原子之5-或6-員雜環烷基、(C_3-C_{60})環烷基、三(C_1-C_{60})烷基矽烷基、二(C_1-C_{60})烷基(C_6-C_{60})芳基矽烷基、三(C_6-C_{60})芳基矽烷基、金剛烷基、(C_7-C_{60})雙環烷基、(C_2-C_{60})烯基、(C_2-C_{60})炔基、氰、(C_1-C_{60})

烷基胺基、(C_6-C_{60})芳基胺基、(C_6-C_{60})芳基(C_1-C_{60})烷基、(C_1-C_{60})烷氧基、(C_1-C_{60})烷硫基、(C_6-C_{60})芳氧基、(C_6-C_{60})芳硫基、(C_1-C_{60})烷氧基羰基、(C_1-C_{60})烷基羰基、(C_6-C_{60})芳基羰基、羧基、硝基以及羥基；

化學式(7)



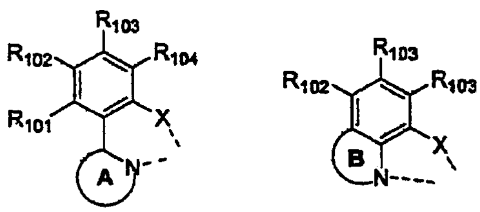
化學式(8)



化學式(9)

$L^1L^2M^1(Q)_y$

在化學式(9)中，該配位子 L^1 以及 L^2 獨立選自下列結構：


；

M^1 為二價或三價金屬；

當 M^1 為二價金屬時，y 為 0，而當 M^1 為三價金屬時，

y 為 1；

Q 表示(C_6-C_{20})芳氧基或三(C_6-C_{20})芳基矽烷基，而且 Q 之芳氧基與三芳基矽烷基可進一步經由(C_1-C_{60})烷基或(C_6-C_{60})芳基取代；

X 代表 O、S 或 Se；

環 A 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 B 表示吡啶或喹啉，而且環 B 可進一步經由(C_1-C_{60})烷基，或具有或不具有(C_1-C_{60})烷基取代基之苯基或萘基所取代；

R_{101} 至 R_{104} 獨立表示氫、鹵素、(C_1-C_{60})烷基、(C_6-C_{60})芳基、(C_4-C_{60})雜芳基、含有一個或多個選自 N、O 及 S 之雜原子之 5-或 6-員雜環烷基、(C_3-C_{60})環烷基、三(C_1-C_{60})烷基矽烷基、二(C_1-C_{60})烷基(C_6-C_{60})芳基矽烷基、三(C_6-C_{60})芳基矽烷基、金剛烷基、(C_7-C_{60})雙環烷基、(C_2-C_{60})烯基、(C_2-C_{60})炔基、氰、(C_1-C_{60})烷基胺基、(C_6-C_{60})芳基胺基、(C_6-C_{60})芳基(C_1-C_{60})烷基、(C_1-C_{60})烷氧基、(C_1-C_{60})烷硫基、(C_6-C_{60})芳氧基、(C_6-C_{60})芳硫基、(C_1-C_{60})烷氧基羰基、(C_1-C_{60})烷基羰基、(C_6-C_{60})芳基羰基、羧基、硝基或羥基，或 R_{101} 至 R_{104} 之各者可經由具有或是不具有稠合環之(C_3-C_{60})伸烷基或(C_3-C_{60})伸烯基鏈結至一相鄰取代基而形成脂環、或是單環或多環之芳香環；

R_{101} 至 R_{104} 之烷基、烯基、炔基、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、芳基胺基、或 R_{101} 至 R_{104} 經由具有或是不具有稠合環之(C_3-C_{60})伸烷基或(C_3-C_{60})伸烯基鏈結至一相鄰取代基所形成的該脂環、或單環或多環之芳香環可進一步經由一個或多個選自下列之取代基取代：鹵素、(C_1-C_{60})烷基、(C_6-C_{60})芳基、(C_4-C_{60})雜芳基、含有一個或多個選自 N、O 以及 S 之雜原子之 5-或 6-員雜環烷基、(C_3-C_{60})環烷基、三(C_1-C_{60})烷基矽烷基、二(C_1-C_{60})烷基(C_6-C_{60})芳基矽烷基、三(C_6-C_{60})芳基矽烷基、金剛烷基、(C_7-C_{60})雙環烷基、(C_2-C_{60})烯基、(C_2-C_{60})炔基、氰、(C_1-C_{60})烷基胺基、(C_6-C_{60})芳基胺基、(C_6-C_{60})芳基(C_1-C_{60})烷基、(C_1-C_{60})烷氧基、(C_1-C_{60})烷硫基、(C_6-C_{60})芳氧基、(C_6-C_{60})芳硫基、(C_1-C_{60})烷氧基羰基、(C_1-C_{60})烷基羰基、(C_6-C_{60})芳基羰基、羧基、硝基以及羥基。

5. 如申請專利範圍第 4 項之有機電場發光裝置，其中，該有機層包括一種或多種選自由芳基胺化合物以及苯乙烯基芳基胺化合物所構成之群組之化合物，或一種或多種選自由第 1 族之有機金屬、第 2I 族之有機金屬、第 4 週期與第 5 週期之過渡金屬、鑭族金屬及 d-過渡元素所構成的群組之金屬。

6. 如申請專利範圍第 4 項之有機電場發光裝置，其包括同時具有藍色或綠色波長之電場發光峰之有機電場發光化合物。

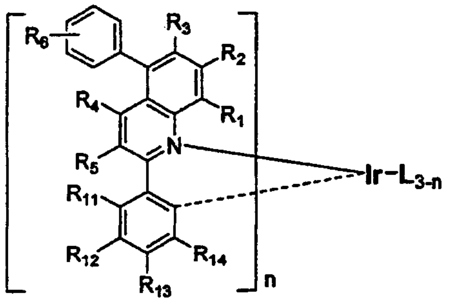
7. 如申請專利範圍第 4 項之有機電場發光裝置，其中，該

有機層包括電場發光層以及電荷產生層。

8. 如申請專利範圍第4項之有機電場發光裝置，其中，於該電極對中之一個或兩個電極之內表面上設置還原性摻雜物與有機物質之混合區域、或氧化性摻雜物與有機物質之混合區域。

9. 一種有機太陽能電池，其包括由化學式(1)所表示之有機電場發光化合物：

化學式(1)

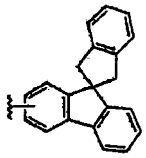


其中，L為有機配位子；

R_1至R_5獨立表示氫、(C_1-C_{60})烷基、(C_1-C_{60})烷氧基、(C_3-C_{60})環烷基、鹵素、三(C_1-C_{60})烷基矽烷基或三(C_6-C_{60})芳基矽烷基；

R_6表示氫、(C_1-C_{60})烷基、鹵素或(C_6-C_{60})芳基；

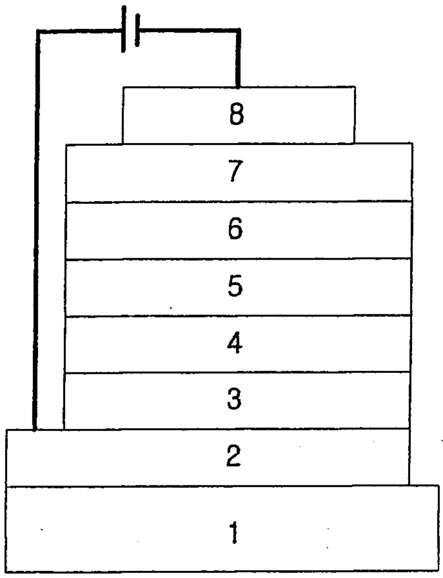
R_{11}至R_{14}獨立表示氫、(C_1-C_{60})烷基、鹵素、氰、三(C_1-C_{60})烷基矽烷基、三(C_6-C_{60})芳基矽烷基、(C_1-C_{60})烷氧基、(C_1-C_{60})烷基羰基、(C_6-C_{60})芳基羰基、二(C_1-C_{60})烷基胺基、二(C_6-C_{60})芳基胺基、苯基、萘基、蒽基、

茀基、螺二茀基或  ，或 R_{11} 至 R_{14} 之各者可經由具有或是不具有稠合環之(C_3-C_{12})伸烷基或(C_3-C_{12})伸烯基鏈結至來自 R_{11} 至 R_{14} 之另一個相鄰基而形成脂環、或是單環或多環之芳香環；

R_{11} 至 R_{14} 之烷基、苯基、萘基、蒽基、茀基，或經由具有或是不具有稠合環之(C_3-C_{12})伸烷基或(C_3-C_{12})伸烯基鏈結而自彼等基形成之該脂環、或單環或多環之芳香環可進一步經由一個或多個選自下列之取代基取代：具有或是不具有鹵素取代基之(C_1-C_{60})烷基、(C_1-C_{60})烷氧基、鹵素、三(C_1-C_{60})烷基矽烷基、三(C_6-C_{60})芳基矽烷基、(C_1-C_{60})烷基羰基、(C_6-C_{60})芳基羰基、二(C_1-C_{60})烷基胺基、二(C_6-C_{60})芳基胺基以及(C_6-C_{60})芳基；以及

n 為 1 至 3 之整數。

八、圖式：



第 1 圖

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	電場發光層	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：