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Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))

Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report:

15 March 2007

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: CURE CATALYST, COMPOSITION, ELECTRONIC DEVICE AND ASSOCIATED METHOD

(57) Abstract: A cure catalyst is provided. The cure catalyst may include a Lewis acid and one or both of a nitrogen-containing molecule or a non-tertiary phosphine. The nitrogen-containing molecule may include a mono amine or a heterocyclic aromatic organic compound. A curable composition may include the cure catalyst. An electronic device may include the curable composition. Methods associated with the foregoing are provided also.



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INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER
INV. B01J31/00 C08G59/68 C08G59/70 H01L23/29

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
B01J C08G H01L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal, CHEM ABS Data, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 3 347 827 A (LEE JR HENRY L) 17 October 1967 (1967-10-17) column 5; examples 3,4 claims 1-4	1,2,4
X	----- US 5 721 183 A (NEITHAMER DAVID R [US]) 24 February 1998 (1998-02-24) column 12; examples 1,4 claim 1	1,2,4-8
X	----- US 2 970 130 A (FINESTONE ARNOLD B) 31 January 1961 (1961-01-31) claim 1 column 3 - column 4; examples I-IX ----- -/-	1,2,4

Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the International filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

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16. 01. 2007

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INTERNATIONAL SEARCH REPORT

International application No

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 106 928 A (SKOULTCHI MARTIN M [US] ET AL) 21 April 1992 (1992-04-21) column 7 - column 8; example 1 claims 1,5-7 -----	1,2,4
X	EP 0 860 458 A2 (REILLY IND INC [US]) 26 August 1998 (1998-08-26) claims 1,5 -----	1-4
X	WO 01/44311 A (DOW CHEMICAL CO [US]) 21 June 2001 (2001-06-21) claims 1,3 page 29; example 65 -----	1-4

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2006/022587

Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-8

Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
- No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-8

Claim 1: a cure catalyst comprising (a) a lewis acid and (b) one or both of a nitrogen-containing molecule or a non-tertiary phosphine, wherein the nitrogen-containing molecule comprises a mono-amine or a heterocyclic aromatic organic compound.

2. claims: 9-34

Claim 9: a curable composition comprising (A) a first mixture comprising a first resin and a first catalyst, the first catalyst comprising (a) a lewis acid and (b) one or both of a non-tertiary amine or a non-tertiary phosphine, (B) a second mixture comprising a second resin and a second catalyst, the second catalyst comprising (a) a lewis acid and (b) one or both of an amine or a non-tertiary phosphine.

Claim 33: A cured film comprising (A) a first mixture comprising a first resin and a first catalyst, the first catalyst comprising (a) a lewis acid and (b) one or both of a mono amine or a heterocyclic aromatic organic compound, (B) a second mixture comprising a second resin and a second catalyst, the second catalyst comprising (a) a lewis acid and (b) one or both of a N-containing molecule or a non-tertiary phosphine.

Claim 34: an electronic device comprising an underfill material comprising the cured film as defined in claim 33 and an electrical connection comprising lead-free solder having at least a portion disposed within the film.

3. claim: 35

an electronic device comprising (i) means for filling a region defined by an inward facing surface of a die and an inward facing surface of a substrate and (ii) an electrical connection comprising lead-free solder, which is operable to secure the die to the substrate.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2006/022587

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