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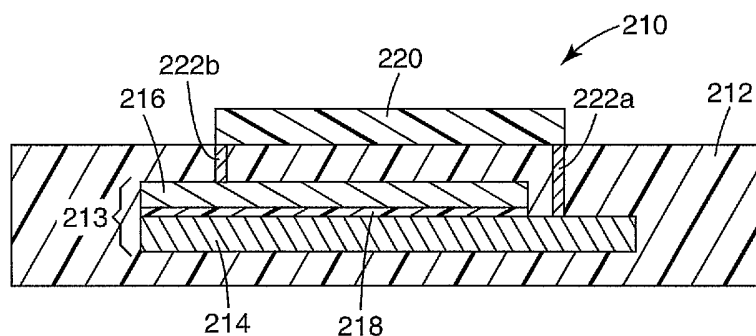
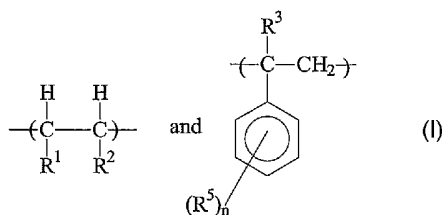
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(54) Title: ORGANIC POLYMERS, LAMINATES, AND CAPACITORS



(57) Abstract: Organic polymers for use in laminates including capacitors, wherein the polymer includes repeat units of the formula: wherein: each R1 is independently H, an aryl group, Cl, Br, I, or an organic group that includes a crosslinkable group; each R2 is independently H, an aryl group or R4; each R3 is independently H or methyl; each R5 is independently an alkyl group, a halogen, or R4; each R4 is independently an organic group that includes at least one CN group and has a molecular weight of about 30 to about 200 per CN group; and n = 0-3; with the proviso that at least one repeat unit in the polymer includes an R4.



GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for all designations

Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, NA,

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER IPC 7 H01L21/312 C08F212/08		
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) IPC 7 C08F C08L 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, INSPEC, CHEM ABS Data, PAJ		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	KLAUK HAGEN ET AL: "High-mobility polymer gate dielectric pentacene thin film transistors" JOURNAL OF APPLIED PHYSICS, AMERICAN INSTITUTE OF PHYSICS. NEW YORK, US, vol. 92, no. 9, 1 November 2002 (2002-11-01), pages 5259-5263, XP012057568 ISSN: 0021-8979 page 5259 - page 5260; figure 1; table 1 ----- -/--	1-42
☒ Further documents are listed in the continuation of box C. ☒ Patent family members are listed in 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 16 March 2005		Date of mailing of the international search report 14. 04. 2005
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016		Authorized officer Wolfbauer, G

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US2004/014101

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	BEDEKAR B A ET AL: "Dielectric relaxation of cyanoethylated poly(2,3-dihydroxypropyl methacrylate)" POLYMER, ELSEVIER SCIENCE PUBLISHERS B.V, GB, vol. 36, no. 25, 1995, pages 4735-4740, XP004194706 ISSN: 0032-3861 page 4735 - page 4736; table 1 -----	1-42
Y	US 5 739 193 A (GOLDBERG HARRIS A ET AL) 14 April 1998 (1998-04-14) abstract -----	9-13,30, 31
Y	US 6 129 986 A (BESSHO ET AL) 10 October 2000 (2000-10-10) column 2 -----	1-42
Y	SHERAW C D ET AL: "SPIN-ON POLYMER GATE DIELECTRIC FOR HIGH PERFORMANCE ORGANIC THIN FILM TRANSISTORS" MATERIALS RESEARCH SOCIETY SYMPOSIUM PROCEEDINGS, MATERIALS RESEARCH SOCIETY, PITTSBURG, PA, US, vol. 558, 4 April 1999 (1999-04-04), pages 403-408, XP001149886 ISSN: 0272-9172 page 403; table 1 -----	1,2, 4-17, 22-42
Y	US 4 034 014 A (O NEILL CHARLES T ET AL) 5 July 1977 (1977-07-05) column 3 - column 4; table III -----	1,2,4-8, 14-17, 20,22-37
A	GARNIER F ET AL: "AN ALL-ORGANIC SOFT THIN FILM TRANSISTOR WITH VERY HIGH CARRIER MOBILITY" ADVANCED MATERIALS, VCH VERLAGSGESELLSCHAFT, WEINHEIM, DE, vol. 2, no. 12, December 1990 (1990-12), pages 592-594, XP000576217 ISSN: 0935-9648 page 592; figure 1 -----	1,3,21, 24,25, 36-42
A	WO 92/11580 A (ALLIED-SIGNAL INC) 9 July 1992 (1992-07-09) the whole document -----	24
A	GREGOR L V: "Polymer dielectric films" IBM JOURNAL OF RESEARCH AND DEVELOPMENT USA, vol. 12, no. 2, March 1968 (1968-03), pages 140-162, XP002320093 the whole document -----	

INTERNATIONAL SEARCH REPORT

International application No.
PCT JS2004/014101

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.:

Remark on Protest

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

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

1. claims: 1-23

An article with a dielectric layer comprising a nonfluorinated organic polymer with repeat units of ethylene and styrene.

The prior art (Mat. Res. Soc. Symp. Proc., Vol 558, 403-408) discloses an organic semiconductor device with organic gate dielectrics.

The special technical feature (Rule 13(2) PCT) of this invention is a nonfluorinated organic polymer with repeat units of ethylene and styrene.

2. claims: 24-36

An article with a dielectric layer comprising a photopatternable specific organic polymer with repeat units of ethylene and styrene.

The special technical feature (Rule 13(2) PCT) of this invention is a photopatternable organic polymer with repeat units of ethylene and styrene.

3. claim: 37

An article with a dielectric layer comprising an organic polymer with repeat units of maleic acid and styrene.

The special technical feature (Rule 13(2) PCT) of this invention is an organic polymer with repeat units of maleic acid and styrene.

4. claim: 38

An article comprising a dielectric layer having an organic polymer with a copolymer of acrylamide and a polystyrene oligomer.

The special technical feature (Rule 13(2) PCT) of this invention is an organic polymer with a copolymer of acrylamide and a polystyrene oligomer.

5. claims: 39-41

An article comprising a dielectric layer having an organic polymer comprising repeat units of para-substituted styrene.

The special technical feature (Rule 13(2) PCT) of this invention is a organic polymer comprising repeat units of para-substituted styrene.

The inventions do not share corresponding technical features such as to link them to form a general inventive concept as required by Rule 13(1) and (2) PCT.

The application relates to a plurality of inventions, or groups of inventions, in the sense of Rule 13.1 PCT. They have been divided as defined above. If the applicant pays additional fees for one (or more) not yet searched group(s) of invention(s), then the further search(es) may reveal further prior art that gives evidence of a further lack of unity 'a posteriori' within one (or more) of the not yet searched group(s). In such a case only the first invention in this (each of these) group(s) of inventions, which is considered to lack unity of invention, will be the subject of a search. No further invitation to pay further additional fees will be issued. This is because Article 17(3)(a) PCT stipulates that the ISA shall establish the International Search Report on those parts of the international application which relate to the invention first mentioned in the claims ('main invention') and for those parts which relate to inventions in respect of which the additional fees were paid. Neither the PCT nor the PCT guidelines provide a legal basis for further invitations to pay further additional search fees (W17/00, point 11 and W1/97, points 11-16).

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
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