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- (81) **Designated States** (unless otherwise indicated, for every
 kind of national protection available): AE, AG, AL, AM,

AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ,
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 DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN,
 HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR,
 KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME,
 MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ,
 OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, SC, SD, SE,
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 kind of regional protection available): ARIPO (BW, GH,
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 TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK,
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 ML, MR, NE, SN, TD, TG).

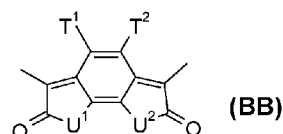
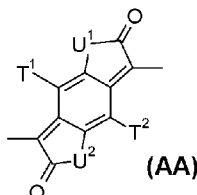
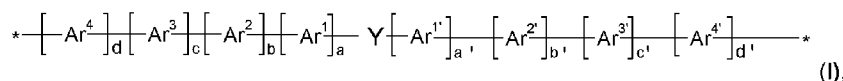
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 claims and to be republished in the event of receipt of
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- (88) **Date of publication of the international search report:**

26 July 2012

- (54) **Title:** POLYMERS BASED ON BENZODIONES



(57) **Abstract:** The present invention relates to polymers comprising one or more (repeating) unit(s) of the formula (I); wherein Y is a group of formula (AA), or (BB) and their use as organic semiconductor in organic devices, especially in organic photovoltaics (solar cells) and photodiodes, or in a device containing a diode and/or an organic field effect transistor. The polymers according to the invention have excellent solubility in organic solvents and excellent film-forming properties. In addition, high efficiency of energy conversion, excellent field-effect mobility, good on/off current ratios and/or excellent stability can be observed, when the polymers according to the invention are used in organic field effect transistors, organic photovoltaics (solar cells) and photodiodes.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP2011/063364

Box No. 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 No. 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 fees, this Authority did not invite payment of additional fees.
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.:

1-6, 14(completely); 8-12(partially)

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER
INV. C08G61/12 H01L51/00
ADD.

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)
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 practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP 1 344 788 A1 (SUMITOMO CHEMICAL CO [JP]) 17 September 2003 (2003-09-17) paragraphs [0253] - [0275]; examples 24-40 -----	1-6, 8-12,14
Y	NAKANO K ET AL: "Synthesis of pi-conjugated copolymer with dibenzo[d,d']benzo[1,2-b:4, 5-b']difuran unit in the main chain", SYNTHETIC METALS, ELSEVIER SEQUOIA, LAUSANNE, CH, vol. 159, no. 9-10, 1 May 2009 (2009-05-01), pages 939-942, XP026120843, ISSN: 0379-6779, DOI: DOI:10.1016/J.SYNTHMET.2009.02.001 [retrieved on 2009-03-18] Schemes 2, 3; page 939 - page 942 ----- -/-	1-6, 8-12,14



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 application or patent 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

12 January 2012

Date of mailing of the international search report

14/06/2012

Name and mailing address of the ISA/

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Marsitzky, Dirk

INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2011/063364

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	GREENHALGH, CAREY, HALL AND NEWTON: "The benzodifuranone chromogen and its application to disperse dyes", JOURNAL OF DYERS AND COLOURISTS, vol. 110, 1994, pages 178-184, XP002622665, schemes 1 and 3; page 178 - page 184 Schemes 1+ 3; page 178 - page 184; tables 1-8 -----	1-6, 8-12,14
Y	EP 0 436 940 A1 (SUMITOMO CHEMICAL CO [JP]) 17 July 1991 (1991-07-17) claims 1-14; examples 1-4; tables 1-8 -----	1-6, 8-12,14

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2011/063364

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1344788	A1	17-09-2003	EP 1344788 A1 17-09-2003
			EP 2107076 A1 07-10-2009
			KR 20100045963 A 04-05-2010
			SG 128438 A1 30-01-2007
			US 2004002576 A1 01-01-2004

EP 0436940	A1	17-07-1991	DE 69034074 D1 18-06-2003
			DE 69034074 T2 01-04-2004
			EP 0436940 A1 17-07-1991

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 1-6, 14(completely); 8-12(partially)

Polymer comprising repeat units of formula (I), their use in optoelectronic devices and a process for the preparation of the polymer

2. claims: 7(completely); 8-12(partially)

Compounds of formula (III) and their use in optoelectronic devices

3. claim: 13

Compounds of formula (V)
