

Europäisches Patentamt
European Patent Office
Office européen des brevets



(11) **EP 1 041 132 A3**

(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
08.11.2000 Bulletin 2000/45

(51) Int. Cl.⁷: **C09K 11/06**, H05B 33/14,
H01L 51/20

(43) Date of publication A2:
04.10.2000 Bulletin 2000/40

(21) Application number: **00106874.1**

(22) Date of filing: **30.03.2000**

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE**
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: **01.04.1999 IT BA990010**

(71) Applicant:
**Istituto Nazionale Per La Fisica Della Materia
16152 Genova (IT)**

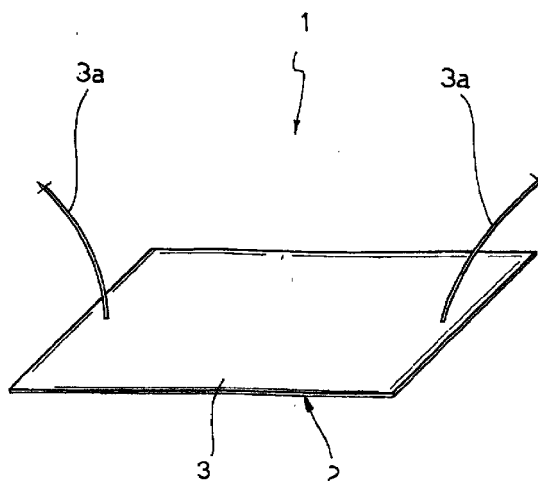
(72) Inventors:
• **Barbarelia, Giovanna**
Via Gobetti, 101 40129 Bologna (IT)

• **Favaretto, Laura**
Via Gobetti, 101 40129 Bologna (IT)
• **Zambianchi, Massimo**
Via Gobetti, 101 40129 Bologna (IT)
• **Cingolani, Roberto**
Via Arnesano 73100 Lecce (IT)
• **Gigli, Giuseppe**
Via Arnesano 73100 Lecce (IT)

(74) Representative:
Eccetto, Mauro et al
Studio Torta S.r.l.,
Via Viotti, 9
10121 Torino (IT)

(54) **Luminescent organic material for light-emitting devices**

(57) A luminescent organic material for light-emitting devices, in particular, for organic LEDs, having at least one thienyl-S,S-dioxide unit obtained by functionalizing the sulfur of a thiophene ring. Inserting a thiophene ring functionalized with oxygen atoms in oligothiophenes of appropriate length and symmetry provided for maintaining or increasing intrinsic quantum efficiency and for modulating the wavelength of the emitted light.



EP 1 041 132 A3



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 00 10 6874

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.CI.7)
P,X	ARBIZZANI, CATIA ET AL: "Polyterthiophene and polypentathiophene S,S-dioxides: new n-dopable polymers" PROC. - ELECTROCHEM. SOC. (1999), 98-26(MOLECULAR FUNCTIONS OF ELECTROACTIVE THIN FILMS), 105-113 , XP000925620 * scheme 1 *	1-5	C09K11/06 H05B33/14 H01L51/20
O,X	& MASTRAGOSTINO ET AL: "Polyterthiophene and Polypentathiophene S,S-Dioxides: New n-Dopable Polymers" THE ELECTROCHEMICAL SOCIETY 194TH MEETING BOSTON, MASS., 3 November 1998 (1998-11-03),	1-5	
O,Y	---	7,8	
X	BARBARELLA, G. ET AL: "Oligothiophene S,S-Dioxides. Synthesis and Electronic Properties in Relation to the Parent Oligothiophenes" J. ORG. CHEM. (1998), 63(16), 5497-5506 , XP002143501 * scheme 1 *	1,2	TECHNICAL FIELDS SEARCHED (Int.CI.7)
X	POUZET, PASCALE ET AL: "Thiophene 1-oxides. V. comparison of the crystal structures and thiophene ring aromaticity of 2,5- diphenylthiophene, its sulfoxide-- and sulfone" J. HETEROCYCL. CHEM. (1997), 34(5), 1567-1574 , XP002143502 * scheme 1 *	1,5	C09K H05B H01L
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 6 September 2000	Examiner Shade, M
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03 82 (P04C01)



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 00 10 6874

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	ARBIZZANI, C. ET AL: "Oligothiophene S,S-dioxides: towards n-type semiconductor oligothiophenes ?" OPT. MATER. (AMSTERDAM) (1998), 9(1-4), 43-45 , XP002143503 * page 45, column 2; table 1 *	1,2	
X	HINSBERG O: "Thioessal-sulfon. Dioxyd des Tetraphenyl-thiophens" CHEMISCHE BERICHTE, vol. 48, 1915, page 1612 XP002143504 * page 1612 *	1	
Y	GEIGER F ET AL: "ELECTROLUMINESCENCE FROM OLIGOTHIOPHENE-BASED LIGHT-EMITTING DEVICES" ADVANCED MATERIALS, DE, VCH VERLAGSGESELLSCHAFT, WEINHEIM, vol. 5, no. 12, 1 December 1993 (1993-12-01), pages 922-925, XP000415071 ISSN: 0935-9648	7,8	
A	* the whole document *	6	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
Place of search THE HAGUE		Date of completion of the search 6 September 2000	Examiner Shade, M
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03 82 (P04C01)

专利名称(译)	用于发光器件的发光有机材料		
公开(公告)号	EP1041132A3	公开(公告)日	2000-11-08
申请号	EP2000106874	申请日	2000-03-30
[标]申请(专利权)人(译)	INFM IST NAZ PER LA FISICA DELLA时珍		
申请(专利权)人(译)	意大利国家PER LA FISICA DELLA时珍		
当前申请(专利权)人(译)	意大利国家PER LA FISICA DELLA时珍		
[标]发明人	BARBARELIA GIOVANNA FAVARETTO LAURA ZAMBIANCHI MASSIMO CINGOLANI ROBERTO GIGLI GIUSEPPE		
发明人	BARBARELIA, GIOVANNA FAVARETTO, LAURA ZAMBIANCHI, MASSIMO CINGOLANI, ROBERTO GIGLI, GIUSEPPE		
IPC分类号	C09K11/06 H01L51/20 H05B33/14		
CPC分类号	C09K11/06		
优先权	101999900749269 1999-04-01 IT		
其他公开文献	EP1041132A2		
外部链接	Espacenet		

摘要(译)

一种用于发光器件的发光有机材料，特别是用于有机LED的发光有机材料，具有通过官能化噻吩环的硫而获得的至少一个噻吩基-S，S-二氧化物单元。在具有适当长度和对称性的低聚噻吩中插入用氧原子官能化的噻吩环提供维持或增加内在量子效率和调节发射光的波长。

