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(54) **Light emitting element and azole compound**

(57) The present invention relates to a light emitting element comprising at least a light emitting layer containing a light emitting material and a host material and having a light emission maximum wavelength of 500 nm or less wherein the minimum excitation triplet energy level of the host material is higher than the minimum excitation triplet energy level of the light emitting material. Preferably, a light emitting element in which the minimum excitation triplet energy level of the host material is from 1.05 times to 1.38 times the minimum excitation triplet energy level of the light emitting material, and a light emitting element in which the minimum excitation triplet energy level of the host material is from 68 kcal/mol to 90 kcal/mol are provided.

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EUROPEAN SEARCH REPORT

Application Number
EP 01 11 7288

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	EP 0 825 804 A (EASTMAN KODAK CO) 25 February 1998 (1998-02-25)	1,4,7,8, 11,13,14	H05B33/14 H01L51/20
A	* page 7, line 55 - page 8, line 19; figure 4; example 4 *	2,3,5,6	C09K11/06 C07D403/04 C07D403/10
X	EP 0 387 715 A (IDEMITSU KOSAN CO) 19 September 1990 (1990-09-19)	1,4,7,8, 11,14	
A	* claims 1-11; example 15 *	2,3,5,6	
X	KOWALSKY W ET AL: "ORGANIC LIGHT EMITTING DIODES" PROCEEDINGS OF THE EIGHTH INTERNATIONAL CONFERENCE ON INDIUM PHOSPHIDEAND RELATED MATERIALS 1996. SCHWABISCH GMUND, APR. 21 - 25, 1996, PROCEEDINGS OF THE INTERNATIONAL CONFERENCE ON INDIUM PHOSPHIDE AND RELATED MATERIALS (IPRM), NEW YORK, IEEE, US, vol. CONF. 8, 21 April 1996 (1996-04-21), pages 450-453, XP000634526 ISBN: 0-7803-3284-9	1,4,7,8, 11,14	
A	* page 450 - page 453; figure 6 *	2,3,5,6	TECHNICAL FIELDS SEARCHED (Int.Cl.7) H05B H01L C09K C07D
X	WO 99 20081 A (UNIV PRINCETON ;UNIV SOUTHERN CALIFORNIA (US)) 22 April 1999 (1999-04-22)	1,7,8,11	
A	* page 86, line 26 - page 88, line 16; claims 1-107; table B3 *	2,3,5,6, 12	

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	5 April 2002	Lehnert, A

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

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Application Number
EP 01 11 7288

CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☒ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 01 11 7288

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	MARIA D S M; CORNAGO P; CLARAMUNT R M; ELGUERO J; FERNANDEZ-CASTANO C; FOCES-FOCES C: "Aromatic propellenes. Part 10. Conformational study of hexa(imidazol-1-yl)benzene and hexakis(2-methylimidazol-1-yl)benzene by means of NMR and AM1 calculations" JOURNAL OF MOLECULAR STRUCTURE, vol. 478, 1999, pages 285-294, XP002194812 * table 1 *	9	
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A	CHENG L F; HUNG L M; DING X M; GAO Z Q; LEE C S; LEE S T: "Photoemission study of a new electroluminescent material: trimer of N-arylbenzimidazoles (TPBI)" DISPLAYS, vol. 21, 2000, pages 51-54, XP002194813 * the whole document *	9,10	TECHNICAL FIELDS SEARCHED (Int.Cl.7)

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	5 April 2002	Lehnert, A

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X : particularly relevant if taken alone
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EPO FORM 1503 03.82 (P04C01)

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LACK OF UNITY OF INVENTION
SHEET B

Application Number
EP 01 11 7288

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. Claims: 1-8,11-14

   A light emitting element as defined in claim 1

2. Claims: 9, 10

   An azole compound as defined in formula (A) of claim 9 and a light emitting element comprising this azole compound

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 01 11 7288

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

05-04-2002

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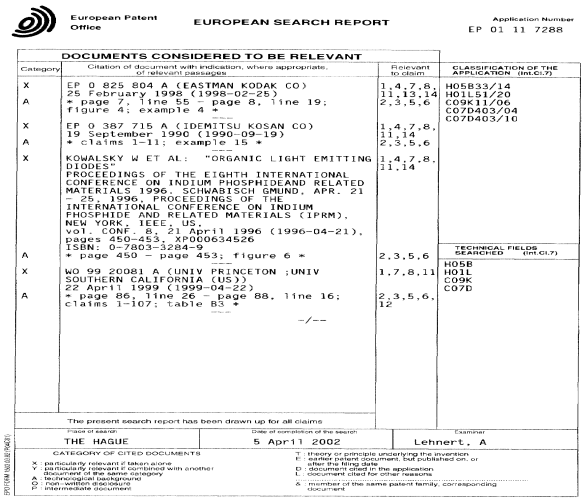
EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

专利名称(译)	发光元素和唑类化合物		
公开(公告)号	EP1175128A3	公开(公告)日	2002-07-31
申请号	EP2001117288	申请日	2001-07-17
[标]申请(专利权)人(译)	富士摄影胶片公司		
申请(专利权)人(译)	富士胶片有限公司.		
当前申请(专利权)人(译)	富士胶片株式会社		
[标]发明人	ISE TOSHIHIRO C O FUJI PHOTO FILM CO LTD IGARASHI TATSUYA C O FUJI PHOTO FILM CO LTD MIYASHITA YOUSUKE C O FUJI PHOTO FILM CO LTD FUJIMURA HIDETOSHI C O FUJI PHOTO FILM CO LTD MISHIMA MASAYUKI C O FUJI PHOTO FILM CO LTD OKADA HISASHI C O FUJI PHOTO FILM CO LTD XUEPENG QIU C O FUJI PHOTO FILM CO LTD		
发明人	ISE, TOSHIHIRO, C/O FUJI PHOTO FILM CO., LTD IGARASHI, TATSUYA, C/O FUJI PHOTO FILM CO., LTD MIYASHITA, YOUSUKE, C/O FUJI PHOTO FILM CO., LTD FUJIMURA, HIDETOSHI, C/O FUJI PHOTO FILM CO., LTD MISHIMA, MASAYUKI, C/O FUJI PHOTO FILM CO., LTD OKADA, HISASHI, C/O FUJI PHOTO FILM CO., LTD XUEPENG, QIU, C/O FUJI PHOTO FILM CO., LTD		
IPC分类号	C09K11/06 H01L51/00 H01L51/30 H01L51/50 H05B33/14 H01L51/20 C07D403/04 C07D403/10		
CPC分类号	H01L51/0085 C09K11/06 H01L51/0035 H01L51/0038 H01L51/004 H01L51/0043 H01L51/005 H01L51/0059 H01L51/0061 H01L51/0062 H01L51/0067 H01L51/0068 H01L51/007 H01L51/0071 H01L51/0072 H01L51/008 H01L51/0081 H01L51/0094 H01L51/5016 H01L2251/308 Y10S428/917 Y10T428/24942 Y10T428/265		
优先权	2000216339 2000-07-17 JP		
其他公开文献	EP1175128B1 EP1175128A2		
外部链接	Espacenet		

摘要(译)

发光元件技术领域本发明涉及一种发光元件，其至少包括含有发光材料和主体材料并且发光最大波长为500nm或更小的发光层，其中主体材料的最小激发三重态能级更高。比发光材料的最小激发三重态能级。优选地，其中主体材料的最小激发三重态能级是发光材料的最小激发三重态能级的1.05倍至1.38倍的发光元件，以及其中最小激发三重态能级的发光元件。提供的主体材料为68kcal / mol至90kcal / mol。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A		2,3,5,6	
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A		2,3,5,6	TECHNICAL FIELDS SEARCHED (Int.Cl.7) H05B H01L C09K C07D
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A		2,3,5,6, 12	

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