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(54) Luminescent material and light-emitting device

(57) A luminescent material which is featured in that it exhibits a light emission peak in a wavelength ranging from 580 to 700 nm when excited with light having a wavelength ranging from 250 to 500 nm and that it has a composition represented by the following general formula (1):

$$(M_{1-x}R_x)_{a1}AlSi_{b1}O_{c1}N_{d1} \quad (1)$$

(In the general formula (1), M is at least one metallic element excluding Si and Al; R is a luminescence center element; and x, a1, b1, c1 and d1 satisfy following relationships:
$0<x\leq 1$, $0.6<a1<0.95$, $2<b1<3.9$, $0.25<c1<0.45$, $4<d1<5.7$).

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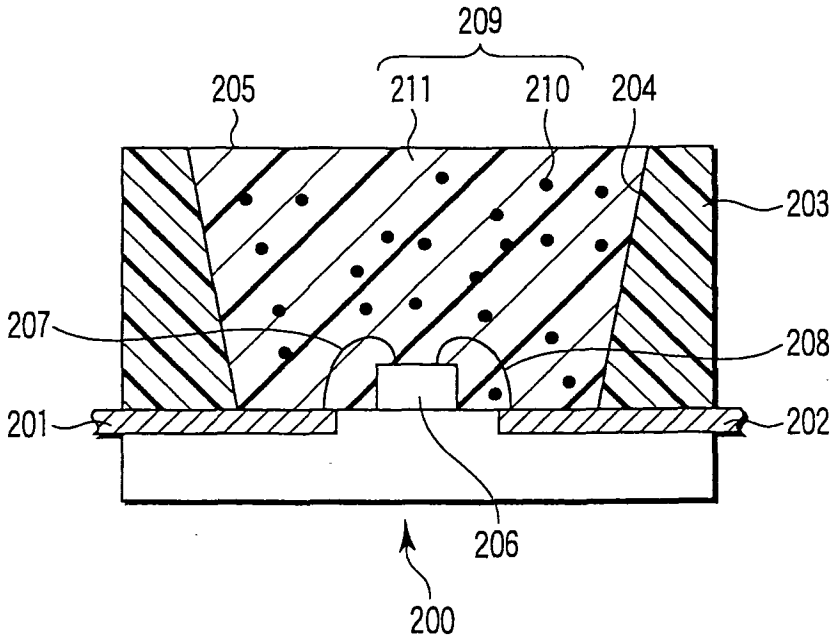

FIG. 2

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PARTIAL EUROPEAN SEARCH REPORT

under Rule 62a and/or 63 of the European Patent Convention. This report shall be considered, for the purposes of subsequent proceedings, as the European search report

Application Number
EP 10 01 4287

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
E	EP 1 777 280 A1 (NAT INST FOR MATERIALS SCIENCE [JP]) 25 April 2007 (2007-04-25) * claim 1 * * paragraph [0159] *	1-20	INV. C09K11/64
A,P	WO 2007/004138 A2 (PHILIPS INTELLECTUAL PROPERTY [DE]; KONINKL PHILIPS ELECTRONICS NV [NL) 11 January 2007 (2007-01-11) * claim 1 *	1-20	
A,P	WO 2006/061778 A1 (PHILIPS INTELLECTUAL PROPERTY [DE]; KONINKL PHILIPS ELECTRONICS NV [NL) 15 June 2006 (2006-06-15) * claim 5 *	1-20	

TECHNICAL FIELDS SEARCHED (IPC)

C09K

INCOMPLETE SEARCH

The Search Division considers that the present application, or one or more of its claims, does/do not comply with the EPC so that only a partial search (R.62a, 63) has been carried out.

Claims searched completely :

Claims searched incompletely :

Claims not searched :

Reason for the limitation of the search:

see sheet C

Place of search	Date of completion of the search	Examiner
Munich	22 July 2011	Saldamli, Saltuk

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 (P04E07)

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INCOMPLETE SEARCH
SHEET C

Application Number
EP 10 01 4287

Claim(s) completely searchable:
9

Claim(s) searched incompletely:
1-8, 10-20

Reason for the limitation of the search:

Present claims 1-8,10-20 relate to an extremely large number of possible compounds and methods/devices thereof. Support and disclosure within the meaning of Articles 84 and 83 EPC are to be found, however, for only a very small proportion of the compounds claimed (see reference examples 1-30 on pages 17-41). In more detail, the subject matter of claim 1 relates to a luminescent material with a composition given by formula 1, wherein M is at least one metallic element excluding Si and Al and R is a luminescence center element.
Non-compliance with the substantive provisions is to such an extent that a meaningful search of the whole claimed subject-matter of the claims could not be carried out (Rule 63 EPC and Guidelines B-VIII, 3). The extent of the search was consequently limited: claim 9 was completely and claims 1-8 and 10-20 were incompletely searched.
The search of claims was restricted to those claimed compounds (and methods/devices thereof) which appear to be supported in the sense of Article 84 EPC; namely, M is strontium and luminescence center element is europium, which are the only elements present given in the examples mentioned above.

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 10 01 4287

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.

22-07-2011

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1777280 A1	25-04-2007	CN 1977030 A	06-06-2007
		JP 4565141 B2	20-10-2010
		JP 2006016413 A	19-01-2006
		WO 2006003961 A1	12-01-2006
		KR 20070046795 A	03-05-2007
		US 2008303409 A1	11-12-2008
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WO 2006061778 A1	15-06-2006	NONE	

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

专利名称(译)	发光材料和发光器件		
公开(公告)号	EP2308946A3	公开(公告)日	2011-08-31
申请号	EP2010014287	申请日	2007-03-09
[标]申请(专利权)人(译)	株式会社东芝		
申请(专利权)人(译)	株式会社东芝		
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IPC分类号	C09K11/64		
CPC分类号	C09K11/0883 C09K11/7734 H01L33/502 H01L2224/48091 H01L2924/00014		
优先权	2006065603 2006-03-10 JP		
其他公开文献	EP2308946B1 EP2308946A2		
外部链接	Espacenet		

摘要(译)

一种发光材料，其特征在于，当用波长为250-500nm的光激发时，其在580-700nm波长范围内具有发光峰值，并具有由下列通式（1）表示的组成。 ）：200320032003200320032003200320032003（M1-xRx）a1AlSib1Oc1Nd12003200320032003200320032003（1）（通式（1）中，M为除Si和Al以外的至少一种金属元素; R为发光中心元素; x，a1，b1，c1和d1满足以下关系：0 <x≤1,0.6<a1 <0.95,2 <b1 <3.9,0.25 <c1 <0.45,4 <d1 <5.7）。

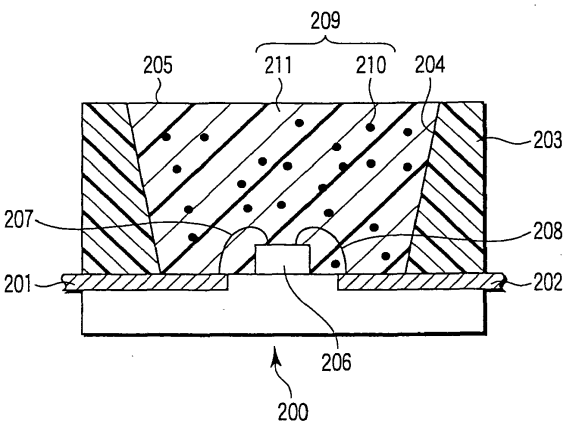

FIG. 2