

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference PU003086WO01	FOR FURTHER ACTION		See item 4 below
International application No. PCT/JP2015/055384	International filing date (<i>day/month/year</i>) 25 February 2015 (25.02.2015)	Priority date (<i>day/month/year</i>) 26 February 2014 (26.02.2014)	
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237			
Applicant DENKA COMPANY LIMITED			

<p>1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 bis.1(a).</p> <p>2. This REPORT consists of a total of 7 sheets, including this cover sheet.</p> <p>In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.</p>																								
<p>3. This report contains indications relating to the following items:</p> <table> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. I</td> <td>Basis of the report</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. V</td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table> <p>4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).</p>	<input checked="" type="checkbox"/>	Box No. I	Basis of the report	<input type="checkbox"/>	Box No. II	Priority	<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	<input type="checkbox"/>	Box No. IV	Lack of unity of invention	<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	<input checked="" type="checkbox"/>	Box No. VI	Certain documents cited	<input type="checkbox"/>	Box No. VII	Certain defects in the international application	<input type="checkbox"/>	Box No. VIII	Certain observations on the international application
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<input type="checkbox"/>	Box No. VIII	Certain observations on the international application																						

	Date of issuance of this report 30 August 2016 (30.08.2016)
The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer Mineko Mohri
Facsimile No. +41 22 338 82 70	e-mail: pt08.pct@wipo.int

PATENT COOPERATION TREATY

TRANSLATION

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

To:

Date of mailing (day/month/year)	19.05.2015
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Applicant's or agent's file reference PU003086WO01
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FOR FURTHER ACTION See paragraph 2 below
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International application No. PCT/JP2015/055384	International filing date (day/month/year) 25.02.2015	Priority date (day/month/year) 26.02.2014
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International Patent Classification (IPC) or both national classification and IPC C09K11/61 (2006.01) i, C09K11/08 (2006.01) i, C09K11/66 (2006.01) i, C09K11/67 (2006.01) i, H01L33/50 (2010.01) i

Applicant DENKI KAGAKU KOGYO KABUSHIKI KAISHA

1. This opinion contains indications relating to the following items:

- Box No. I Basis of the opinion
- Box No. II Priority
- Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- Box No. IV Lack of unity of invention
- Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- Box No. VI Certain documents cited
- Box No. VII Certain defects in the international application
- Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA/JP	Date of completion of this opinion	Authorized officer
Facsimile No.		Telephone No.

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

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Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:
 - the international application in the language in which it was filed
 - a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).
2. This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))
3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished:
 - a. (means)
 - on paper
 - in electronic form
 - b. (time)
 - in the international application as filed
 - together with the international application in electronic form
 - subsequently to this Authority for the purposes of search
4. In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No. PCT/JP2015/055384
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Box No. V	Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
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1. Statement			
Novelty (N)	Claims	1-4	YES
	Claims	_____	NO
Inventive step (IS)	Claims	_____	YES
	Claims	1-4	NO
Industrial applicability (IA)	Claims	1-4	YES
	Claims	_____	NO

2. Citations and explanations:	
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Document 1: JP 2009-528429 A (LUMINATION L.L.C.) 06 August 2009

Document 2: JP 2012-224536 A (SHIN-ETSU CHEMICAL CO., LTD.) 15 November 2012

Document 3: JP 2013-249375 A (MITSUBISHI CHEMICAL CORP.) 12 December 2013

Document 4: JP 58-089680 A (KASEI OPTONIX, LTD.) 28 May 1983

Document 5: JP 04-178486 A (SUMITOMO CHEMICAL CO., LTD.) 25 June 1992

Document 6: US 6020067 A (KASEI OPTONIX, LTD.) 01 February 2000, BACKGROUND OF THE INVENTION, example, claims

The invention as in claims 1-4 lacks novelty and does not involve an inventive step in the light of documents 1-6 cited in the ISR.

Document 1 discloses a phosphor represented by $A_2[MF_6]:Mn^{4+}$, wherein K may be selected as A, and an element which is the same as that of present application may be selected as element M (claims).

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Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

In addition, an illuminating device using said phosphor is also described.

Moreover, the examples disclose multiple phosphors that satisfy the feature pertaining to the invention of the present application (paragraph [0028]).

Similarly, document 2 also discloses a phosphor that satisfies the feature of the invention of the present application as $A_2MF_6:Mn$ (claims), and the examples also illustrate multiple phosphors that satisfy the feature pertaining to the invention of the present application. Furthermore, a person skilled in the art would normally use said phosphor for an illuminating device or the like.

In addition, documents 3-6 each disclose a phosphor coated by a calcium phosphate and a calcium polysaccharide, a metal alkoxide containing chlorine, or an equivalent substance designed to maximize luminance and humidity resistance (see document 3, entire text, in particular, claims, example 1; document 4, entire text, in particular, claims, examples; document 5, entire text, in particular, claims, examples; document 6, BACKGROUND OF THE INVENTION, Examples).

In addition, the coating weights of the calcium phosphate and magnesium calcium phosphate described in documents 3 and 5 fulfill the numerical range of the invention of the present application, and the metal alkoxide described in document 6 contains the level of Cl that satisfies the numerical range of the invention of the present application.

Moreover, the adaption of the luminance and humidity resistance is merely a well-known matter in the technical field of phosphors, and thus is naturally considered in the phosphors described in documents 1 and 2 as well.

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Box No. V

**Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

In view of the foregoing, in the inventions of documents 1 and 2, a person skilled in the art could easily apply the coating described in each of documents 3-6, thereby arriving at the configuration of the invention of the present application.

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Box No. VI **Certain documents cited**

1. Certain published documents (Rule 43*bis*.1 and 70.10)

<u>Application No. Patent No.</u>	<u>Publication date (day/month/year)</u>	<u>Filing date (day/month/year)</u>	<u>Priority date (valid claim) (day/month/year)</u>
JP 2015-044951 A	12.03.2015	29.08.2013	

2. Non-written disclosures (Rule 43*bis*.1 and 70.9)

<u>Kind of non-written disclosure</u>	<u>Date of non-written disclosure (day/month/year)</u>	<u>Date of written disclosure referring to non-written disclosure (day/month/year)</u>
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