

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY
(PCT Rule 43bis.1)**

To:

see form PCT/ISA/220

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/EP2018/062732

International filing date (day/month/year)
16.05.2018

Priority date (day/month/year)
27.06.2017

International Patent Classification (IPC) or both national classification and IPC
INV. C09K11/06 H01L51/50

Applicant
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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 and 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 usually 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:



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Date of completion of this opinion

see form
PCT/ISA/210

Authorized Officer

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Box No. I Basis of the 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 43bis.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:
 - a. forming part of the international application as filed:
 - in the form of an Annex C/ST.25 text file.
 - on paper or in the form of an image file.
 - b. furnished together with the international application under PCT Rule 13ter.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.
 - c. furnished subsequent to the international filing date for the purposes of international search only:
 - in the form of an Annex C/ST.25 text file (Rule 13ter.1(a)).
 - on paper or in the form of an image file (Rule 13ter.1(b) and Administrative Instructions, Section 713).
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 forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5. Additional comments:

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

1. Statement

Novelty (N)	Yes: Claims	<u>1-14</u>
	No: Claims	
Inventive step (IS)	Yes: Claims	<u>1-14</u>
	No: Claims	
Industrial applicability (IA)	Yes: Claims	<u>1-14</u>
	No: Claims	

2. Citations and explanations

see separate sheet

Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following document:

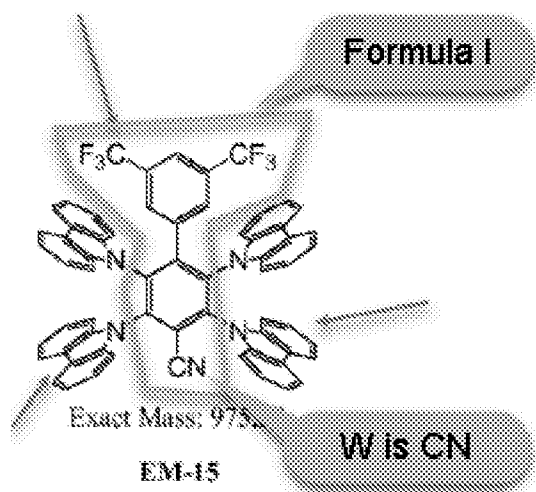
D1 WO 2014/183080 A1 (NITTO DENKO CORP [JP]; SHIJUN ZHENG [US]; ADAM BASIAGO [US]) 13 November 2014 (2014-11-13)

1 **Organic molecule** (claim 1)

1.1 The document **D1** is regarded as being the closest prior art to the subject-matter of claim **1**, because

- it discloses a similar organic molecule and because
- a similar technical problem is addressed therein, namely the provision of organic molecules for use in OLEDs (paragraph 1).

Specifically disclosed is e.g. molecule EM-15 on page 59:



, which translates into the

nomenclature of the present invention as:

Formula I: R1 and R2 are hydrogen, W is CN, all of T, V, X and Y are linking groups to Formula II.

Formula II. Z is a direct bond, Ra is H.

- 1.2 The molecule of claim 1 therefore differs from that of D1 by
- Formula I must carry a CN group and a CF3 group instead of two CF3 groups.
 - Only two of V, W, X, Y can be a group according two Formula II. In other

words, only two carbazoyl-groups are allowed instead of the four as in EM-15. Hence, the subject matter of present claim 1 is new in the sense of Article 33(2) PCT.

- 1.3 The technical effect of this difference is not known.
- 1.4 The problem to be solved by the present invention may therefore be regarded as how to provide an alternative organic molecule suitable for use in e.g. OLEDs.
- 1.5 No prior art document gives the skilled person any information which would have enabled him/her to unambiguously arrive at the subject matter of present claim 1 ("would/could approach": PCT guidelines, chapters 13.13-13.15). In other words, even if the skilled person could have arrived at the claimed subject matter, it is not inevitable when starting from D1. Hence, the skilled person, starting from **D1** and trying to find an alternative organic molecule would need inventive skills to arrive at the subject matter of claim 1. In short. **claim 1 is inventive.**
- 1.6 The **dependant claims 2-7 are** therefore also **new and inventive** (Article 33(1) and (2) PCT).
- 1.7 Likewise, **a process for preparing such molecules** (claim 8), **the use of such molecules in an organic optoelectronic device** (claims 9, 10), **a composition comprising such molecules** (claim 11), **an organic device comprising such molecules** (claims 12, 13), and **a process for producing such devices** (claim 14) are inventive, as the reasoning provided for claim 1 is equally valid for said claims.