

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 121-145b	FOR FURTHER ACTION	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/IB2017/055290	International filing date (<i>day/month/year</i>) 03 Sep 2017	(Earliest) Priority Date (<i>day/month/year</i>) 04 Sep 2016
Applicant ARIEL SCIENTIFIC INNOVATIONS LTD.		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 4 sheets.

It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the **language**, the international search was carried out 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)).

b. This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6bis(a)).

c. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. **Certain claims were found unsearchable** (see Box No. II).

3. **Unity of invention is lacking** (see Box No. III).

4. With regard to the **title**,

the text is approved as submitted by the applicant.

the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

the text is approved as submitted by the applicant.

the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

a. the figure of the **drawings** to be published with the abstract is Figure No. 2

as suggested by the applicant.

as selected by this Authority, because the applicant failed to suggest a figure.

as selected by this Authority, because this figure better characterizes the invention.

b. none of the figures is to be published with the abstract.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/IB2017/055290

A. CLASSIFICATION OF SUBJECT MATTER

IPC (2017.01) B01D 71/68, B01D 69/10, B01D 71/50, B01D 71/06, B01D 67/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC (2017.01) B01D 71/68, B01D 69/10, B01D 71/50, B01D 71/06, B01D 67/00

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Databases consulted: Google Patents, CAPLUS, Google Scholar, DWPI, Derwent Innovation

Search terms used: polymer membrane, support, gas, oxygen, separation, transport, diffusion, carrier, phthalocyanine, polycarbonate.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	Eishun Tsuchida et al., 'Effect of Polymer Matrix on the Oxygen Diffusion via a Cobalt Porphyrin Fixed in a Membrane', <i>Macromolecules</i> , 24, pp. 6306-6309, 1991. Eishun Tsuchida et al. 31 Dec 1991 (1991/12/31) p. 6306-6308	1-46
Y	p. 6306-6308	48-50
X	Hiroyuki NISHIDE et al., 'High Oxygen Permeation and Persistent Oxygen-Carrying in a Poly (vinylimidazole-co-fluoroalkyl methacrylate)-Cobaltporphyrin Membrane', <i>Polymer Journal</i> , Vol. 33 (10), pp. 807-811, 2001. Hiroyuki NISHIDE et al. 31 Dec 2001 (2001/12/31) p. 807, 808-810, figure 2	1-46
Y	p. 807, 808-810, figure 2	48-50

 Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

28 Nov 2017

Date of mailing of the international search report

28 Nov 2017

Name and mailing address of the ISA:

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/IB2017/055290

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	Yoshio Okahata et al., 'Highly Selective Transport of Molecular Oxygen in a Polymer Containing a Cobalt Porphyrin Complex as a Fixed Carrier', <i>Macromolecules</i> , 19, pp. 494-496, 1986. Yoshio Okahata et al. 31 Dec 1986 (1986/12/31) p. 494,495	1-46
Y	p. 494,495	48-50
X	JUIN-YIH LAI et al., 'Effect of Nonsolvent/Oxygen Carrier Additives on Gas Separation Performance of Polycarbonate Membranes', <i>SEPARATION SCIENCE AND TECHNOLOGY</i> , 32(5), pp. 925-937, 1997. JUIN-YIH LAI et al. 31 Dec 1997 (1997/12/31) p. 926, 927, 937, abstract.	1-45
X	p. 926, 931,932, abstract, figure 1	47
Y	p. 926, 927, 931,932, 937, abstract, figure 1.	48-50
X	WO 2010086630 A1 SANDRU MARIUS [NO]; KIM TAEK-JOONG [NO]; HAEGG MAY-BRITT [NO] 05 Aug 2010 (2010/08/05) p. 3, lines 22-30, p. 6, p. 10, lines 11-13, Example 3.	1-45
Y	p. 3, lines 22-30, p. 6, p. 10, lines 11-13, Example 3.	48-50
Y	Mathias Ulbricht, 'Advanced functional polymer membranes', <i>Polymer</i> 47, pp. 2217-2262, 2006. Mathias Ulbricht 31 Dec 2006 (2006/12/31) abstract	48-50

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/IB2017/055290

Patent document cited search report	Publication date	Patent family member(s)	Publication Date
WO 2010086630 A1	05 Aug 2010	WO 2010086630 A1	05 Aug 2010
		GB 0901699 D0	11 Mar 2009
		US 2012067209 A1	22 Mar 2012
		US 8764881 B2	01 Jul 2014
		US 2014283685 A1	25 Sep 2014
		US 9623380 B2	18 Apr 2017