

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

To:

see form PCT/ISA/220

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

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/US2022/044112

International filing date (day/month/year)
20.09.2022

Priority date (day/month/year)
11.11.2021

International Patent Classification (IPC) or both national classification and IPC
INV. C09K8/035 C09K8/528

Applicant
DOW GLOBAL TECHNOLOGIES LLC

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.
 - b. ☐ furnished subsequent to the international filing date for the purposes of international search (Rule 13ter.1(a)),
 - ☐ accompanied by a statement to the effect that the sequence listing does not go beyond the disclosure in the international application as filed.
4. ☐ With regard to any nucleotide and/or amino acid sequence disclosed in the international application, this opinion has been established to the extent that a meaningful opinion could be formed without a WIPO Standard ST.26 compliant sequence listing.
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>1-9</u>
	No: Claims	
Inventive step (IS)	Yes: Claims	<u>1-9</u>
	No: Claims	
Industrial applicability (IA)	Yes: Claims	<u>1-9</u>
	No: Claims	

2. Citations and explanations

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re 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 documents:

- D1 EP 0 459 661 A1 (ROHM & HAAS [US]) 4 December 1991 (1991-12-04)
- D2 US 5 277 823 A (HANN WILLIAM M [US] ET AL) 11 January 1994
(1994-01-11)
- D3 WO 2019/055129 A1 (DOW GLOBAL TECHNOLOGIES LLC [US]; ROHM
& HAAS [US]) 21 March 2019 (2019-03-21)

Document D1 is considered as being the closest prior art, and discloses a method for controlling silicate scale formation in an aqueous system using a specific co- or terpolymer based on (meth)acrylic acid or maleic acid.

In the example, (see Table I), the sample 41 is a terpolymer comprising 57wt% acrylic acid / 23 wt% AMPS / 20 wt% PEM, wherein PEM stands for phosphoethyl methacrylate.

The subject-matter of claim 1 therefore differs from this known disclosure in that the phosphoethyl methacrylate composition includes at least 10 wt% of phosphoethyl methacrylate monoester, at least 10 wt% of phosphoethyl methacrylate diester, and at least 5 wt% of phosphoric acid, based on a total weight of the phosphoethyl methacrylate composition and is therefore new (Article 33(2) PCT).

The technical problem to be solved by the present invention may be regarded as improving the scale inhibiting action and compatibility in high TDS brines.

The solution to this problem proposed in claim 1 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons :

Mixtures of phosphoethyl methacrylate monoester, phosphoethyl methacrylate diester, phosphoric acid and methyl methacrylate is known from document D3 (see cl.2 ; examples), also as a commercial composition (QM1326), but for a different use : adhesive composition.

Furthermore, said document do not explicitly disclose amount ranges for the four compounds.

Hence, the skilled person wanting to solved the aforementioned technical problem would not consider document D3, for a different technical field (adhesives), to be used as "monomeric compound" to form the claimed terpolymer.

Claim(s) 2-9 are dependent or referring back to claim 1 and as such also meet(s) the requirements of the PCT with respect to novelty and inventive step.

Re Item VII

Certain defects in the international application

- 1 The units "psi" employed on p.10 of the description are not additionally expressed in terms of the units stipulated by Rule 10.1/(a)/and/(b) PCT. This should be corrected.

Re Item VIII

Certain observations on the international application

- 1 Present independent claim 7 is related to a composition, "A scale inhibitor for oil and gas production", having as only technical feature the following : "including the scale inhibitor composition as claimed in any one of claims 1 to 6".
Hence, there appear to be no further limitation when comparing product claim 7 and product claims 1 to 6 (this appears also to be confirmed by method claim 8, only depending on the product of claims 1-6).
Therefore present claim 7 is considered as being redundant, and therefore as lacking clarity under the requirements of Art. 6 PCT.