

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

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/EP2024/084393

International filing date (day/month/year)
03.12.2024

Priority date (day/month/year)
05.12.2023

International Patent Classification (IPC) or both national classification and IPC
INV. A01N43/40 A01P7/04 A01N25/30 A01N25/02

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

Sawicki, Marcin

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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. II Priority

1. ☐ The validity of the priority claim has not been considered because the International Searching Authority does not have in its possession a copy of the earlier application whose priority has been claimed or, where required, a translation of that earlier application. This opinion has nevertheless been established on the assumption that the relevant date (Rules 43bis.1 and 64.1) is the claimed priority date.
2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43bis.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.
3. Additional observations, if necessary:

see separate sheet

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>1-15</u>
	No: Claims	
Inventive step (IS)	Yes: Claims	<u>13-15</u>
	No: Claims	<u>1-12</u>
Industrial applicability (IA)	Yes: Claims	<u>1-15</u>
	No: Claims	

2. Citations and explanations

see separate sheet

Re point II

1. Priority:

The claimed priority is partially invalid because some of the embodiments/features were not disclosed in the priority document.

Re point V

1. Relates to a water-soluble liquid concentrate formulation comprising: a) flupyradifurone, b) an alkyl-polypropylene-polyethylene glycol, c) a lactic acid ester and d) a dialkyl sulfoxide.

2. Novelty (Art. 33(2)PCT):

Reference is made to the following documents:

D1 US 2011/086848 A1 (STORK ANDREAS [DE] ET AL) (2011-04-14)

D2 WO 98/17277 A1 (VIRBAC SA [FR]; DERRIEU GUY [FR] ET AL.) (1998-04-30)

D3 WO 2023/056540 A1 (IHARABRAS S A INDUSTRIAS QUIM [BR]) (2023-04-13)

D4 WO 2022/189592 A1 (UPL CORPORATION LTD [MU]; UPL EUROPE LTD [GB]) (2022-09-15)

D1 discloses a composition comprising: 17 g of active compound (*e.g.* **flupyradifurone** (*compound B*)); 20-40 g alkyl polyethylene-polypropylene glycol of formula (I) from Tab. 1; 43-63 g of water miscible solvent (*propylene carbonate, benzyl alcohol, γ -butyrolactone*) and 25 mg antifoam (see par. 140-144, 182, Tab. I-VI). DMSO is given as alternative solvent (see par. 90). Does not use currently claimed solvent mixture.

D2 discloses a stable concentrate comprising *inter alia*: **flupyradifurone** 75 g; compound I-2 12 g; Diammonium hydroxyphosphate 250 g; **Antarox B848 (alkyl polyethoxy-polypropoxy ether)** 200 g; and 512.5-572.5 of glycol solvent (see par. 451, ex. 1, Tab. 1). Does not use currently claimed solvent mixture.

D3 discloses a stable emulsifiable concentrate 2.12 comprising: 2,4-D TEA salt 876 g; lactofen 60 g; **DMSO** 80 g; **ethyl lactate** 30 g; **EO/PO-copolymer-butyl ether** 10 g (see p. 28, Tab. 2 and par. 51). The composition does not comprise flupyradifurone.

D4 discloses a stable solution of acetamiprid comprising: acetamiprid 10 g; **ethyl**

lactate or **DMSO** 50 ml and alkylether of ethylene or propylene glycol about 40 ml (see p. 20, ex. 11). DMSO and ethyl lactate are used as alternatives, the emulsifier comprises either propylene or ethylene glycol, the composition does not comprise flupyradifurone.

Consequently claims 1-15 are new and fulfil the requirements of Art. 33(2)PCT.

3. Inventive step (Art. 33(3)PCT):

D1 can be seen as the closest prior art in respect to the subject matter of claims 1-15. In currently claimed concentrates that was selected as water miscible solvent and additionally alkyl lactate was added. The applicant showed that soluble concentrates of flupyradifurone ($> 225 \text{ g/L}$) comprising $\text{Bu-(PO)}_x\text{-(EO)}_y$ and a mixture of butyl lactate and DMSO at certain quantities, in place of or in addition to propylene carbonate used in **D1**, have better cold storage stability, better solubility and/or better dilutability in particular for highly concentrated flupyradifurone concentrates. The same was not shown for all alkyl-(PO)-(EO) and **D1** teaches that it is essential for solubility in water that the alkyl chain is short, preferably $\text{C}_3\text{-C}_4\text{-alkyl}$. Moreover the quantities of solvents are not defined and it is not credible that stable soluble concentrates will be formed at any concentrations/ratios. Therefore at the present time said effect can be seen as credibly shown only for claims 13-15.

Therefore the problem to be solved for claims 13-15 can be defined as provision of improved soluble concentrate and for claims 1-12 as provision of alternative concentrate.

There is nothing in the prior art that would direct the skilled artisan to expect better stability and dilutability for the soluble concentrates of claims 13-15. Therefore said compositions are inventive (*as well broader claims defining closer b) and ranges e.g. 3+7, thus comprising all essential features necessary to achieve higher stability seems inventive*) .

Concerning claims 1-12 **D1** teaches that to prepare stable concentrates comprising 17 % flupyradifurone one should use solvent such as DMSO and $\text{Bu-(PO)}_x\text{-(EO)}_y$. Even if lactate ester is not mentioned in **D1** it is a known solvent which was used with $\text{Alkyl-(PO)}_x\text{-(EO)}_y$ and DMSO in in pesticide formulations (see e.g. **D3-D4**) and thus if no specific effect needs to be achieved it would be obvious to add some of it to the compositions of **D1**.

Therefore claims 1-12 are obvious.