WHO SPECIFICATIONS AND EVALUATIONS

FOR PUBLIC HEALTH PESTICIDES

PHOXIM

O,O-diethyl α-cyanobenzylideneamino-oxyphosphonothioate

World Health Organization

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Disclaimer[1]

WHO specifications are developed with the basic objective of promoting, as far as practicable, the manufacture, distribution and use of pesticides that meet basic quality requirements.

Compliance with the specifications does not constitute an endorsement or warranty of the fitness of a particular pesticide for a particular purpose, including its suitability for the control of any given pest, or its suitability for use in a particular area. Owing to the complexity of the problems involved, the suitability of pesticides for a particular purpose and the content of the labelling instructions must be decided at the national or provincial level.

Furthermore, pesticides which are manufactured to comply with these specifications are not exempted from any safety regulation or other legal or administrative provision applicable to their manufacture, sale, transportation, storage, handling, preparation and/or use.

WHO disclaims any and all liability for any injury, death, loss, damage or other prejudice of any kind that may be arise as a result of, or in connection with, the manufacture, sale, transportation, storage, handling, preparation and/or use of pesticides which are found, or are claimed, to have been manufactured to comply with these specifications.

Additionally, WHO wishes to alert users to the fact that improper storage, handling, preparation and/or use of pesticides can result in either a lowering or complete loss of safety and/or efficacy.

WHO is not responsible, and does not accept any liability, for the testing of pesticides for compliance with the specifications, nor for any methods recommended and/or used for testing compliance. As a result, WHO does not in any way warrant or represent that any pesticide claimed to comply with a WHO specification actually does so.

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[1] This disclaimer applies to all specifications published by WHO.

PART ONE

SPECIFICATIONS

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PHOXIM

INFORMATION

ISO common name

phoxim (BSI, E-ISO, ESA); phoxime ((*f*) F-ISO)

Synonyms

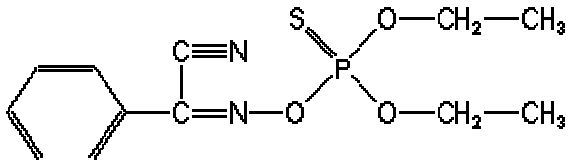
none

Chemical names

IUPAC *O,O*-diethyl α-cyanobenzylideneamino-oxyphosphonothioate

CA 4-ethoxy-7-phenyl-3,5-dioxa-6-aza-4-phosphaoct-6-ene-8-nitrile 4-sulfide

Structural formula



Molecular formula

$C_{12}H_{15}N_2O_3PS$

Relative molecular mass

298.3

CAS Registry number

14816-18-3

CIPAC number

364

Identity tests

HPLC retention time, TLC

PHOXIM TECHNICAL CONCENTRATE

Full specification WHO/SIT/29.R2 (updated on March 2011*)

1 Description

The material shall consist of phoxim together with related manufacturing impurities, in the form of a reddish-brown liquid, and shall be free from visible extraneous matter and added modifying agents except for the stabilizer (Note 1).

2 Active ingredient

2.1 **Identity tests** (364/TK/(M)/2, CIPAC Handbook 1C, p. 2187, 1985)

The active ingredient shall comply with an identity test and, where the identity remains in doubt, shall comply with at least one additional test.

2.2 **Phoxim content** (364/TK/(M)/3, CIPAC Handbook 1C, p. 2188, 1985)

The phoxim content shall be declared (not less than 820 g/kg) and, when determined, the average measured content shall not be lower than the declared minimum content.

3 Relevant impurity

3.1 **Water content** (MT 30.5, CIPAC Handbook J, p. 120, 2000)

Maximum: 1 g/kg.

4 Physical properties

4.1 **Acidity** (MT 191, CIPAC Handbook L, p. 143, 2006)

Maximum acidity: 1 g/kg calculated as H_2SO_4.

Note 1 The technical product is a redish oil at room temperature but is not commercially available as such. It is only available as technical concentrate containing approximately 10% butanol as stabilizer.

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* This specification is only an updated version of the specification developed under the old procedure. No new data were submitted for this compound, nevertheless, as this compound is still used in some countries, the 2010 JMPS decided to maintain the specification instead of withdrawing it.

Specifications may be revised and/or additional evaluations may be undertaken. Ensure the use of current versions by checking at: http://www.who.int/quality/en/.

PHOXIM EMULSIFIABLE CONCENTRATE

Full specification WHO/SIF/51.R2 (updated on March 2011*)

1 Description

The material shall consist of technical phoxim, complying with the requirements of WHO specification WHO/SIT/29.R2 (updated on March 2011), dissolved in suitable solvents, together with any other necessary formulants. It shall be in the form of a stable homogeneous liquid, free from visible suspended matter and sediment, to be applied as an emulsion after dilution in water.

2 Active ingredient

2.1 **Identity tests** (364/EC/(M)/2, CIPAC Handbook 1C, p. 2189, 1985)

The active ingredient shall comply with an identity test and, where the identity remains in doubt, shall comply with at least one additional test.

2.2 **Phoxim content** (364/EC/(M)/3, CIPAC Handbook 1C, p. 2189, 1985)

The phoxim content shall be declared (g/kg or g/l at 20 ± 2°C, Note 1) and, when determined, the average content measured shall not differ from that declared by more than the following tolerances:

Declared content, g/kg or g/l at 20 ± 2ºC	Tolerance
above 250 up to 500	± 5% of the declared content
above 500	± 25 g/kg or g/l
Note: in each range the upper limit is included	

3 Relevant impurity

3.1 **Water content** (MT 30.5, CIPAC Handbook J, p. 120, 2000)

Maximum: 2 g/kg.

4 Physical properties

4.1 **Acidity** (MT 191, CIPAC Handbook L, p. 143, 2006)

Maximum acidity: 5 g/kg calculated as H_2SO_4.

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* This specification is only an updated version of the specification developed under the old procedure. No new data were submitted for this compound, nevertheless, as this compound is still used in some countries, the 2010 JMPS decided to maintain the specification instead of withdrawing it.

Specifications may be revised and/or additional evaluations may be undertaken. Ensure the use of current versions by checking at: http://www.who.int/quality/en/.

4.2 **Emulsion stability and re-emulsification** (MT 36.1.1, CIPAC Handbook F, p. 108, 1995) (Note 2)

The formulation, when diluted at 30 ± 2°C with CIPAC Standard Waters A and D, shall comply with the following:

Time after dilution	Limits of stability
0 h	Initial emulsification complete
0.5 h	"Cream", maximum: 1 mL
2.0 h	"Cream", maximum: 2 mL "Free oil", none
24 h	Re-emulsification complete
24.5 h	"Cream", maximum: 2 mL "Free oil", none
Note: tests after 24 h are required only where the results at 2 h are in doubt.	

4.3 **Persistent foam** (MT 47.2, CIPAC Handbook F, p. 152, 1995) (Note 3)

Maximum: 60 mL after 1 min in CIPAC Standard Water A.

5 Storage stability

5.1 **Stability at 0°C** (MT 39.3, CIPAC Handbook J, p. 126, 2000)

After storage at 0 ± 2°C for 7 days, the volume of solid and/or liquid which separates shall not be more than 0.3 mL.

5.2 **Stability at elevated temperature**
(MT 46.3, CIPAC Handbook J, p. 128, 2000)

After storage at 54 ± 2°C for 14 days, the determined average active ingredient content must not be lower than 95% relative to the determined average content found before storage (Note 4) and the formulation shall continue to comply with the clauses for:

- acidity or alkalinity (4.1);
- emulsion stability and re-emulsification (4.2).

Note 1 If the buyer requires both g/kg and g/l at 20°C, then in case of dispute the analytical results shall be calculated as g/kg.

Note 2 The formulation will be tested at 5% dilution.

Note 3 The mass of sample to be used in the test should correspond to the highest rate of use recommended by the supplier.

Note 4 Samples of the formulation taken before and after the storage stability test should be analyzed concurrently after the test in order to reduce the analytical error.

PART TWO

EVALUATION REPORTS

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based on review of specifications by JMPS **10**

PHOXIM

FAO/WHO EVALUATION REPORT 364/2010

Recommendations

The Meeting recommended the following.

(i) The existing WHO specifications for phoxim TC (WHO/SIT/29.R1, December 1999) and EC (WHO/SIF/51.R1, December 1999) should be withdrawn.

(ii) The updated WHO specifications for phoxim TC and EC, as proposed by JMPS, should be adopted by WHO and published under the category of specifications developed under the old procedure.

Appraisal

The Meeting considered the review of the existing WHO specifications for phoxim TC (WHO/SIT/29.R1, December 1999) and EC (WHO/SIF/51.R1, December 1999).

The Meeting considered that the purpose of the reviews is to update the methods only and that clauses in the old specifications should remain. The Meeting agreed to add a footnote against the date of the specification to indicate that the date applies to the date of publication of the specification and that it is only an updated version of a specification developed under the old procedure.

The updated specifications include the following changes by comparison with the old specifications.

General considerations

- The updated specifications for phoxim TC and EC were written according to the format requirements (specification guidelines) of the FAO/WHO Manual (November 2010 - second revision of the First Edition).
- Information on phoxim was added in the updated specifications.
- The methods for phoxim content extensively described in the old specifications were referenced in the updated specifications to the existing CIPAC methods published in Handbook 1C.
- While maintaining the clauses and their respective limits, the methods for physico-chemical properties referenced in the old specifications were updated according to the current CIPAC referee methods when applicable.
- The information on packaging and marking of packages of the old specifications were withdrawn in the updated specifications because this information is no longer required under the new procedure.

Phoxim emulsifiable concentrates (EC)

- A clause for identity tests referring to the CIPAC method for phoxim EC was added in the updated specification.
- For the emulsion stability and persistent foam tests, the WHO standard soft and hard waters mentioned in the old specification were replaced in the updated specification by the CIPAC Standard Water A and D respectively.
- For the emulsion stability test, the method WHO/M/29 (with examination after only 2 h) of the old WHO specification was replaced in the updated specification by the CIPAC method MT 36.1.1 (with examination at 0 h, 0.5 h, 2.0 h, 24 h and 24.5 h). The clause of maximum 2 ml cream at 2.0 h in the old specification was maintained in the updated specification. The clause limits at 0 h, 0.5 h, 24 h and 24.5 h were defined in the updated specification on basis of the model adopted in the existing WHO specifications for lambda-cyhalothrin EC, temephos EC, lindane EC and dichlorvos EC.
- For the stability at 0°C, the default value of "not more than 0.3 mL for the volume of solid and/or liquid which separates" was adopted in the updated specification.
- The test for flash point of the old specification was withdrawn in the updated specification, as recommended by the specification guideline for EC of the FAO/WHO Manual (November 2010 - second revision of the First Edition).