

Fenamiphos; CASRN 22224-92-6

Human health assessment information on a chemical substance is included in the IRIS database only after a comprehensive review of toxicity data, as outlined in the [IRIS assessment development process](#). Sections I (Health Hazard Assessments for Noncarcinogenic Effects) and II (Carcinogenicity Assessment for Lifetime Exposure) present the conclusions that were reached during the assessment development process. Supporting information and explanations of the methods used to derive the values given in IRIS are provided in the [guidance documents located on the IRIS website](#).

STATUS OF DATA FOR Fenamiphos

File First On-Line 09/30/1987

Category (section)	Assessment Available?	Last Revised
Oral RfD (I.A.)	yes	09/30/1987
Inhalation RfC (I.B.)	not evaluated	
Carcinogenicity Assessment (II.)	not evaluated	

I. Chronic Health Hazard Assessments for Noncarcinogenic Effects

I.A. Reference Dose for Chronic Oral Exposure (RfD)

Substance Name — Fenamiphos

CASRN — 22224-92-6

Last Revised — 09/30/1987

The oral Reference Dose (RfD) is based on the assumption that thresholds exist for certain toxic effects such as cellular necrosis. It is expressed in units of mg/kg-day. In general, the RfD is an estimate (with uncertainty spanning perhaps an order of magnitude) of a daily exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime. Please refer to the Background Document for an elaboration of these concepts. RfDs can also be derived for the noncarcinogenic health effects of substances that are also carcinogens. Therefore, it is essential to refer to other sources of

information concerning the carcinogenicity of this substance. If the U.S. EPA has evaluated this substance for potential human carcinogenicity, a summary of that evaluation will be contained in Section II of this file.

I.A.1. Oral RfD Summary

Critical Effect	Experimental Doses*	UF	MF	RfD
ChE inhibition	NOEL: 1 ppm diet (0.025 mg/kg/day)	100	1	2.5E-4 mg/kg/day
2-Year Feeding Dog Study	LEL: 2 ppm diet (0.05 mg/kg/day)			
Chemagro Corp., 1972a				

*Conversion Factors: 1 ppm = 0.025 mg/kg/day (assumed dog food consumption)

I.A.2. Principal and Supporting Studies (Oral RfD)

Chemagro Corporation. 1972a. MRID No. 00037965. Available from EPA. Write to FOI, EPA, Washington, DC 20460.

Fenamiphos (78.8%) was fed to six groups of four male and four female dogs at dose levels of 0, 0.5, 1, 2, 5, or 10 ppm for 2 years. Blood tests for sedimentation, hemoglobing, RBC, WBC, hematocrit, differential leukocyte counts were negative. Liver function test for AP, SGOT, SGPT, Oct, SDH and serum protein were negative. Cholinesterase activity was depressed at 2, 5 and 10 ppm. Brain cholinesterase was not measured. The NOEL for cholinesterase inhibition was 1 ppm. No other effects were observed at any dose level.

I.A.3. Uncertainty and Modifying Factors (Oral RfD)

UF — An uncertainty factor of 100 has been used to account for both intra- and interspecies differences.

MF — None

I.A.4. Additional Studies/Comments (Oral RfD)

Teratogenic studies were positive for rabbits (chain-fused sternebrae). However, these effects occurred at levels above maternal toxicity and the RfD ($2.5E-4$) is 3 orders of magnitude less than the Fetotoxic NOEL (0.3 mg/kg/day). A 2-year feeding/oncogenic study started 2/28/83; results have not yet been reviewed.

Data Considered for Establishing the RfD:

- 1) 2-Year Feeding - dog: Principal study - see previous description; core grade minimum
- 2) 2-Year Feeding (oncogenic) - rat: Systemic NOEL=10 ppm (0.5 mg/kg/day); Systemic LEL=30 ppm (1.5 mg/kg/day) (HDT; increased mortality rate, increased thyroid gland weights and lung weights); ChE NOEL=3 ppm (0.15 mg/kg/day); ChE LEL=10 ppm (slight ChE inhibition); core grade minimum (pathology evaluation deficient) (Chemagro Corp., 1972b)
- 3) 3-Generation Reproduction - rat: Systemic NOEL=10 ppm (0.5 mg/kg/day); Systemic LEL=30 ppm (1.5 mg/kg/day) (decreased weight gain at F2b males); Reproductive NOEL=30 ppm (HDT); core grade minimum (Chemagro Corp., 1972c)
- 4) Teratology - rat: NOEL=0.5 mg/kg/day (HDT); core grade minimum (Mobay Chemical, 1981)
- 5) Teratology - rabbit: Maternal NOEL=0.1 mg/kg/day; Maternal LEL=0.3 mg/kg/day (decreased weight gain); Fetotoxic NOEL=0.3 mg/kg/day; Fetotoxic LEL=1.0 mg/kg/day (HDT) (weight and mortality); core grade guideline (Mobay Chemical, 1982a)

Other Data Reviewed:

- 1) 18 Month Oncogenic - mice: Systemic NOEL=none; Systemic LEL=2 ppm (0.3 mg/kg/day) (decreased absolute brain weights); core grade minimum (Mobay Chemical, 1982b)
- 2) No delayed neurotoxic effects in hens up to 12.4 mg/kg (Mobay Chemical, 1971)

Data Gap(s): none

I.A.5. Confidence in the Oral RfD

Study — High
Database — High
RfD — High

The principal study appears to be of good quality and is given a high confidence rating. Additional studies are of good quality and are supportive of the RfD; therefore, the database is given a high confidence rating. High confidence in the RfD follows.

I.A.6. EPA Documentation and Review of the Oral RfD

Pesticide Registration Files

Agency Work Group Review — 04/08/1986, 11/25/1986, 12/09/1986

Verification Date — 12/09/1986

Screening-Level Literature Review Findings — A screening-level review conducted by an EPA contractor of the more recent toxicology literature pertinent to the RfD for Fenamiphos conducted in November 2001 identified one or more significant new studies. IRIS users may request the references for those studies from the IRIS Hotline at hotline.iris@epa.gov or (202)566-1676.

I.A.7. EPA Contacts (Oral RfD)

Please contact the IRIS Hotline for all questions concerning this assessment or IRIS, in general, at (202)566-1676 (phone), (202)566-1749 (FAX) or hotline.iris@epa.gov (internet address).

I.B. Reference Concentration for Chronic Inhalation Exposure (RfC)

Substance Name — Fenamiphos
CASRN — 22224-92-6

Not available at this time.

II. Carcinogenicity Assessment for Lifetime Exposure

Substance Name — Fenamiphos
CASRN — 22224-92-6

This substance/agent has not undergone a complete evaluation and determination under US EPA's IRIS program for evidence of human carcinogenic potential.

III. [reserved]

IV. [reserved]

V. [reserved]

VI. Bibliography

Substance Name — Fenamiphos
CASRN — 22224-92-6

VI.A. Oral RfD References

Chemagro Corporation. 1972a. MRID No. 00037965. Available from EPA. Write to FOI, EPA, Washington, DC 20460.

Chemagro Corporation. 1972b. MRID No. 00038490. Available from EPA. Write to FOI, EPA, Washington, DC 20460.

Chemagro Corporation. 1972c. MRID No. 00037979. Available from EPA. Write to FOI, EPA, Washington, DC 20460.

Mobay Chemical Corporation. 1971. MRID No. 00057606. Available from EPA. Write to FOI, EPA, Washington, DC 20460.

Mobay Chemical Corporation. 1981. MRID No. 00154498. Available from EPA. Write to FOI, EPA, Washington, DC 20460.

Mobay Chemical Corporation. 1982a. MRID No. 00121286. Available from EPA. Write to FOI, EPA, Washington, DC 20460.

Mobay Chemical Corporation. 1982b. MRID No. 00098614. Available from EPA. Write to FOI, EPA, Washington, DC 20460.

VI.B. Inhalation RfC References

None

VI.C. Carcinogenicity Assessment References

None

VII. Revision History

Substance Name — Fenamiphos

CASRN — 22224-92-6

Date	Section	Description
12/03/2002	I.A.6.	Screening-Level Literature Review Findings message has been added.

VIII. Synonyms

Substance Name — Fenamiphos

CASRN — 22224-92-6

Last Revised — 09/30/1987

- 22224-92-6
- BAY 68138
- ENT 27572
- ER

- ETHYL 3-METHYL-4-(METHYLTHIO)PHENYL(1-METHYLETHYL)PHOSPHORAMIDATE
- ETHYL 4-(METHYLTHIO)-m-TOLYL ISOPROPYLPHOSPHORAMIDATE
- Fenamiphos
- ISOPROPYLAMINO-O-ETHYL-(4-METHYLMERCAPTO-3-METHYLPHENYL)PHOSPHATE
- 1-(METHYLETHYL)-ETHYL 3-METHYL-4-(METHYLTHIO)PHENYL PHOSPHORAMIDATE
- (3-METHYL-4-(METHYLTHIO)PHENYL) ESTER
- NEMACUR
- NEMACUR P
- NSC 195106
- O-AETHYL-O-(3-METHYL-4-METHYLTHIOPHENYL)-ISOPROPYLAMIDO-PHOSPHORSAEUREEST-PHENAMIPHOS
- PHOSPHORAMIDIC ACID, (1-METHYLETHYL)-, ETHYL
- SRA 3886