

Biphenanthrin; CASRN 82657-04-3

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 Biphenanthrin

File First On-Line 08/22/1988

Category (section)	Assessment Available?	Last Revised
Oral RfD (I.A.)	yes	08/22/1988
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 — Biphenanthrin
CASRN — 82657-04-3
Primary Synonym — Talstar
Last Revised — 08/22/1988

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
Tremors	NOEL: 1.5 mg/kg/day	100	1	1.5E-2 mg/kg/day
1-Year Dog Feeding Study	LEL: 3.0 mg/kg/day			
FMC Corporation, 1985				

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

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

FMC Corporation. 1985. Accession No. 264637. Available from EPA. Write to FOI, EPA, Washington, DC 20460.

Beagle dogs (23 to 29 weeks of age; 4 dogs/sex/dose) were administered biphenrin in the diet at concentrations of 0 (Group 1), 0.75 (Group 2), 1.5 (Group 3), 3.0 (Group 4), and 5.0 (Group 5) mg/kg/day for 52 weeks. Animals were inspected daily for appearance, behavior, appetite, and fecal elimination and twice daily for signs of toxicity and mortality. The findings of note include tremors in groups 4 and 5. Tremors were intermittent in one male and two females of group 4 between weeks 15 and 23. All group 5 dogs displayed tremors between weeks 15 and 29. Males appeared to display a greater incidence of tremors. Tremors did not persist past week 29. No other treatment-related effects were noted.

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

UF — An uncertainty factor of 100 was used, 10 each to account for the inter- and intraspecies differences.

MF — None

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

The NOELs for developmental effects in rats are lower than the NOEL chosen to establish the RfD. However, it is concluded that the RfD is sufficiently low to account for developmental effects, providing a significant margin of safety. Furthermore, the teratology study used dosing by gavage, which does not reflect dietary exposure.

Data Considered for Establishing the RfD

- 1) 1-Year Feeding - dog: Principal study - see previous description; core grade minimum
- 2) 2-Year Feeding (oncogenic) - rat: Systemic NOEL=50 ppm (2.5 mg/kg/day); Systemic LEL=100 ppm (5 mg/kg/day) (tremors, elevated body weight, higher but statistically significant liver and kidney organ-to-body weight ratios); core grade minimum (FMC Corp., 1986a)
- 3) 2-Generation Reproduction - rat: Maternal NOEL=30 ppm (1.5 mg/kg/day); Maternal LEL=60 ppm (3 mg/kg/day) (lower but statistically significant mean body weights of P1 and F1 females); Reproduction and Fetotoxic NOEL=100 ppm (5 mg/kg/day); Reproduction and Fetotoxic LEL=none; core grade minimum (FMC Corp., 1986b)
- 4) Teratology - rat: Maternal NOEL=1 mg/kg/day; Maternal LEL=2 mg/kg/day (HDT; tremors); Fetotoxic NOEL=1 mg/kg/day; Fetotoxic LEL=2 mg/kg/day (HDT; increased incidence of hydroureter without hydronephrosis, an equivocal finding); Teratogenic NOEL=2 mg/kg/day (HDT); Teratogenic LEL=none; core grade minimum (FMC Corp., 1984a)
- 5) Teratology - rabbit: Maternal NOEL=2.67 mg/kg/day; Maternal LEL=4 mg/kg/day (head and forelimb twitching); Fetotoxic and Teratogenic NOEL=8 mg/kg/day (HDT); Fetotoxic and Teratogenic LEL=none; core grade minimum (FMC Corp., 1984b)

Other Data Reviewed:

- 1) 13-Week Feeding - dog: NOEL=2.21 mg/kg/day; LEL=4.42 mg/kg/day (tremors); core grade minimum (FMC Corp., 1984c)
- 2) 90-Day Feeding - rat: NOEL=50 ppm (2.5 mg/kg/day); LEL=100 ppm (5 mg/kg/day) (tremors in some males and females during first 16 days); core grade minimum (FMC Corp., 1984d)

Data Gap(s): None

I.A.5. Confidence in the Oral RfD

Study — Medium
Database — High
RfD — High

The critical study is of adequate quality and is given a medium confidence rating. The database is given a high confidence rating due to the similarities of NOELs in the supporting data. High confidence in the RfD follows.

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

Source Document — This assessment is not presented in any existing U.S. EPA document.

Other EPA Documentation — Pesticide Registration Files

Agency Work Group Review — 02/25/1988, 05/25/1988, 07/20/1988

Verification Date — 07/20/1988

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 Biphenthrin conducted in September 2002 did not identify any critical new studies. IRIS users who know of important new studies may provide that information to 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 — Biphenthrin
CASRN — 82657-04-3
Primary Synonym — Talstar

Not available at this time.

II. Carcinogenicity Assessment for Lifetime Exposure

Substance Name — Biphenthrin
CASRN — 82657-04-3
Primary Synonym — Talstar

Not available at this time.

III. [reserved]

IV. [reserved]

V. [reserved]

VI. Bibliography

Substance Name — Biphenthrin
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Primary Synonym — Talstar

VI.A. Oral RfD References

FMC Corporation. 1985. EPA Accession No. 264637. Available from EPA. Write to FOI, EPA, Washington D.C. 20460.

FMC Corporation. 1986a. EPA Accession No. 26194042, 26194447. Available from EPA. Write to FOI, EPA, Washington D.C. 20460.

FMC Corporation. 1986b. EPA Accession No. 26193335, 26193739. Available from EPA. Write to FOI, EPA, Washington D.C. 20460.

FMC Corporation. 1984a. EPA Accession No. 254409. Available from EPA. Write to FOI, EPA, Washington D.C. 20460.

FMC Corporation. 1984b. EPA Accession No. 254410. Available from EPA. Write to FOI, EPA, Washington D.C. 20460.

FMC Corporation. 1984c. EPA Accession No. 254408. Available from EPA. Write to FOI, EPA, Washington D.C. 20460.

FMC Corporation. 1984d. EPA Accession No. 254407. Available from EPA. Write to FOI, EPA, Washington D.C. 20460.

VI.B. Inhalation RfC References

None

VI.C. Carcinogenicity Assessment References

None

VII. Revision History

Substance Name — Biphenthrin

CASRN — 82657-04-3

Primary Synonym — Talstar

Date	Section	Description
08/22/1988	I.A.	Oral RfD summary on-line
12/03/2002	I.A.6.	Screening-Level Literature Review Findings message has been added.

VIII. Synonyms

Substance Name — Biphenthrin

CASRN — 82657-04-3

Primary Synonym — Talstar

Last Revised — 08/22/1988

- 82657-04-3
- Biphenthrin
- brigade

- cyclopropanecarboxylic acid, 3-(2-chloro-3,3,3-trifluoro-1-propenyl)-2,2-dimethyl-,(2-methyl(1,1'-biphenyl)-3-yl)methyl ester, (z)-
- FMC 54800
- Talstar