

Carboxin; CASRN 5234-68-4

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 Carboxin

File First On-Line 01/31/1987

Category (section)	Assessment Available?	Last Revised
Oral RfD (I.A.)	yes	01/31/1987
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 — Carboxin

CASRN — 5234-68-4

Last Revised — 01/31/1987

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
Reduced weight gain, organ weight changes, increased mortality, 2-Year Rat Feeding Study Uniroyal Chemical, 1969a	NOEL: 200 ppm (10 mg/kg/day) LEL: 600 ppm (30 mg/kg/day)	100	1	1E-1 mg/kg/day

*Conversion Factors -- 1 ppm = 0.05 mg/kg/day (assumed rat food consumption)

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

Uniroyal Chemical. 1969a. MRID No. 00003031, 00021628. Available from EPA. Write to FOI, EPA, Washington D.C. 20460.

Thirty male and 30 female weanling rats (Charles River Caesarean-derived strain) per group were fed technical D735 (carboxin) at dietary levels of 100 ppm (Group 2), 200 ppm (Group 3), and 600 ppm (Group 4); 60 rats of each sex comprised the control group (Group 1) and received the basal diets only; the diets were available on an ad libitum basis. The observed effects included reduced weight gain and food consumption, increased mortality, and reduced kidney, heart, and spleen weights.

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

UF — The UF of 100 includes uncertainties in the extrapolation from laboratory animals to humans.

MF — None

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

The NOEL of the 2-year rat study used for establishing the RfD is supported by the 3-generation rat reproduction study showing the same NOEL.

Data Considered for Establishing the RfD

- 1) 2-Year Feeding (Oncogenic) - rat: Principal study - see previous description; no core grade
- 2) 2-Year Feeding - dog: NOEL=600 ppm (15 mg/kg/day) (HDT); no core grade (Uniroyal Chemical, 1969b) 3) 3-Generation Reproduction - rat: NOEL=200 ppm (10 mg/kg/day); LEL=600 ppm (30 mg/kg/day) (depression of pup growth); core grade minimum (Uniroyal Chemical, 1968)
- 4) Teratology - rat: NOEL=40 mg/kg/day (highest level tested); core grade minimum (Uniroyal Chemical, 1977)
- 5) Teratology - rabbit: Maternal and Fetotoxic NOEL=375 mg/kg/day; Maternal and Fetotoxic LEL=750 mg/kg/day; Teratogenic NOEL=750 mg/kg/day (HDT); core grade guideline (Uniroyal Chemical, 1981)

Other Data Reviewed:

- 1) 90-Day Feeding - rat: NOEL=200 ppm (10 mg/kg/day); LEL=600 ppm (30 mg/kg/day) (degeneration of kidneys); no core grade (Uniroyal Chemical, 1966)

Data Gap(s): none

I.A.5. Confidence in the Oral RfD

Study — Medium

Database — High

RfD — High

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

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

Office of Pesticide Programs Files (No Registration Standard for this chemical)

Agency Work Group Review — 03/26/1986

Verification Date — 03/26/1986

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 Carboxin 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)

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Not available at this time.

II. Carcinogenicity Assessment for Lifetime Exposure

Substance Name — Carboxin

CASRN — 5234-68-4

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 — Carboxin
CASRN — 5234-68-4

VI.A. Oral RfD References

Uniroyal Chemical. 1966. MRID No. 00003063. Available from EPA. Write to FOI, EPA, Washington D.C. 20460.

Uniroyal Chemical. 1968. MRID No. 00003032. Available from EPA. Write to FOI, EPA, Washington D.C. 20460.

Uniroyal Chemical. 1969a. MRID No. 00003031, 00021628. Available from EPA. Write to FOI, EPA, Washington D.C. 20460.

Uniroyal Chemical. 1969b. MRID No. 00003030, 00021627. Available from EPA. Write to FOI, EPA, Washington D.C. 20460.

Uniroyal Chemical. 1977. MRID No. 00003120, 00053729. Available from EPA. Write to FOI, EPA, Washington D.C. 20460.

Uniroyal Chemical. 1981. MRID No. 00086054. 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 — Carboxin

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

VIII. Synonyms

Substance Name — Carboxin

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Last Revised — 01/31/1987

- 5234-68-4
- 5-CARBOXANILIDO-2,3-DIHYDRO-6-METHYL-1,4-OXATHIIN
- Carboxin
- CARBOXINE
- D 735
- DCMO
- 2,3-DIHYDRO-5-CARBOXANILIDO-6-METHYL-1,4-OXATHIIN
- 5,6-DIHYDRO-2-METHYL-3-CARBOXANILIDO-1,4-OXATHIIN
- 5,6-DIHYDRO-2-METHYL-N-PHENYL-1,4-OXATHIIN-3-CARBOXAMIDE
- 2,3-DIHYDRO-6-METHYL-1,4-OXATHIIN-5-CARBOXANILIDE
- 5,6-DIHYDRO-2-METHYL-1,4-OXATHIIN-3-CARBOXANILIDE
- F 735
- FLO PRO V SEED PROTECTANT
- 1,4-OXATHIIN-3-CARBOXAMIDE, 5,6-DIHYDRO-2-METHYL-N-PHENYL-
- 1,4-OXATHIIN-3-CARBOXANILIDE, 5,6-DIHYDRO-2-METHYL-
- 1,4-OXATHIIN, 2,3-DIHYDRO-5-CARBOXANILIDO-6-METHYL-
- VITAVAX