

Methomyl; CASRN 16752-77-5

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 Methomyl

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 — Methomyl

CASRN — 16752-77-5

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
Kidney and Spleen Pathology	NOEL: 100 ppm (2.5 mg/kg/day)	100	1	2.5E-2 mg/kg/day
2-Year Feeding Study Dogs	LEL: 400 ppm (10 mg/kg/day)			
du Pont, 1968a				

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

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

E.I. du Pont de Nemours & Company, Inc. 1968a. MRID No. 00007091, 00009012. Available from EPA. Write to FOI, EPA, Washington, DC 20460.

Beagle dogs (4/sex/dose) were fed methomyl in their ad libitum diets. The diets contained 0 (control), 50, 100, 400, and 1000 ppm methomyl. Dose-related histopathologic changes were observed in kidney and spleen at 400 and 1000 ppm and in the liver and bone marrow at 1000 ppm level. The enlarged prostate gland in one animal each of the 100 and 400 ppm dose group was not considered compound-related since the effect was not dose-related and since dogs tend to show prostate enlargement with age. The NOEL for systemic effects was 100 ppm (2.5 mg/kg/day).

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

UF — A UF of 100 was used to extrapolate animal data accounting for intra- and inter-species differences.

MF — None

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

The NOEL (100 ppm) observed in the dog study is further supported by lifetime studies in rats and mice, and a reproduction study in rats. In converting ppm to mg/kg/day, the dog study yields the lowest NOEL of all species tested. The NOEL for maternal toxicity in the rabbit was 2 mg/kg/day. Although a fraction lower than the NOEL used to establish the RfD, this NOEL was not used since exposure in teratology studies is by gavage and the chronic study in dogs more closely reflects continuous dietary exposure.

Data Considered for Establishing the RfD:

1. 2-Year Feeding - dog: Principal study - see discussion above; core grade minimum
2. 22-Month Feeding - rat: NOEL 100 ppm (5 mg/kg/day); LEL 200 ppm (10 mg/kg/day) (effects on spleen) (females) (du Pont, 1968b)
3. 2-Year Feeding - rat: NOEL 100 ppm (5 mg/kg/day); LEL 400 ppm (10 mg/kg/day) (ChE inhibition, growth retardation) (1981); core grade minimum (du Pont, 1981a)
4. 3-Generation Reproduction - rat: NOEL 100 ppm (5 mg/kg/day); core grade minimum (du Pont, 1968c)
5. Teratology - rat: No teratogenic effects at highest dose, 400 ppm; maternal toxicity at 400 ppm (du Pont, 1978)
6. Teratology - rabbit: No teratogenic effects at highest dose 16 mg/kg/day; maternal toxicity at 6 mg/kg/day (death and CNS effects) (du Pont, 1983)

Data Gap(s): None

Other Data Reviewed:

1. 2-Year Feeding (oncogenic) - mice: Systemic NOEL=50 ppm (7.5 mg/kg/day); Systemic LEL=11 mg/kg/day (du Pont, 1981b)
2. Delayed Neurotoxicity - Hens: Not a neurotoxin - tested up to 200 mg/kg/day (du Pont, 1967)

I.A.5. Confidence in the Oral RfD

Study — Medium

Database — High

RfD — High

The 2-year dog study used for supporting the RfD is of adequate quality, but considering the study date (1968) not entirely in compliance with today's requirements. However, the rest of the database is of very good quality and supports the finding in the dog study; therefore, confidence in the database is high. High confidence in the RfD follows.

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

Pesticide Registration Files

Agency Work Group Review — 04/22/1986

Verification Date — 04/22/1986

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 Methomyl conducted in November 2001 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 — Methomyl

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Not available at this time.

II. Carcinogenicity Assessment for Lifetime Exposure

Substance Name — Methomyl

CASRN — 16752-77-5

Not available at this time.

III. [reserved]

IV. [reserved]

V. [reserved]

VI. Bibliography

Substance Name — Methomyl

CASRN — 16752-77-5

VI.A. Oral RfD References

E.I. du Pont de Nemours & Company, Inc. 1967. MRID No. 00008827. Available from EPA. Write to FOI, EPA, Washington, DC 20460.

E.I. du Pont de Nemours & Company, Inc. 1968a. MRID No. 00007091, 00009012. Available from EPA. Write to FOI, EPA, Washington, DC 20460.

E.I. du Pont de Nemours & Company, Inc. 1968b. MRID No. 00007092, 00009011. Available from EPA. Write to FOI, EPA, Washington, DC 20460.

E.I. du Pont de Nemours & Company, Inc. 1968c. MRID No. 00007093. Available from EPA. Write to FOI, EPA, Washington, DC 20460.

E.I. du Pont de Nemours & Company, Inc. 1978. MRID No. 00008621. Available from EPA. Write to FOI, EPA, Washington, DC 20460.

E.I. du Pont de Nemours & Company, Inc. 1981a. MRID No. 00078361. Available from EPA. Write to FOI, EPA, Washington, DC 20460.

E.I. du Pont de Nemours & Company, Inc. 1981b. MRID No. 00078423. Available from EPA. Write to FOI, EPA, Washington, DC 20460.

E.I. du Pont de Nemours & Company, Inc. 1983. MRID No. 00131257. 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 — Methomyl

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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 — Methomyl

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Last Revised — 01/31/1987

- 16752-77-5
- ACETIMIDIC ACID, N-((METHYLCARBAMOYL)OXY)THIO-,METHYL ESTER
- ACETIMIDIC ACID, THIO-N-((METHYLCARBAMOYL)OXY)-,METHYL ESTER
- ACETIMIDOTHIOIC ACID, METHYL-, N-(METHYLCARBAMOYL) ESTER
- DUPONT 1179
- ENT 27,341
- ETHANIMIDOTHIOIC ACID, N-(((METHYLAMINO)CARBONYL)OXY)-, METHYL ESTER
- IN 1179
- LANNATE

- LANNATE L
- MESOMILE
- Methomyl
- METHYL N-((METHYLAMINO)CARBONYL)OXY)ETHANIMIDO)THIOATE
- 2-METHYLTHIO-ACETALDEHYD-O-(METHYLCARBAMOYL)-OXIM
- 2-METHYLTHIO-PROPIONALDEHYD-O-(METHYLCARBAMOYL)-OXIM
- METOMIL
- N-(((METHYLAMINO)CARBONYL)OXY)ETHANIMIDOTHIOIC ACID METHYL ESTER
- NU-BAIT II
- NUDRIN
- RCRA WASTE NUMBER P066
- SD 14999
- 3-THIABUTAN-2-ONE, O-(METHYLCARBAMOYL)OXIME
- WL 18236