

Bromoxynil octanoate; CASRN 1689-99-2

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 Bromoxynil octanoate

File First On-Line 03/31/1987

| Category (section) | Assessment Available? | Last Revised |
|----------------------------------|-----------------------|--------------|
| Oral RfD (I.A.) | yes | 09/07/1988 |
| 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 — Bromoxynil octanoate

CASRN — 1689-99-2

Last Revised — 09/07/1988

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 |
|---------------------------------|--|-----|----|-------------------|
| No effects | NOEL: 100 ppm bromoxynil (7.3 mg/kg/day bromoxynil octanoate) | 300 | 1 | 2E-2 mg/kg/day |
| 2-Year Rat Feeding Study | LEL: None | | | |
| Union Carbide, 1982 | | | | |

*Conversion Factors: 1 ppm = 0.05 mg/kg/day (assumed rat food consumption); dose adjusted by the ratio of the molecular weights of bromoxynil octanoate (402.8) and bromoxynil (276.8).

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

Union Carbide Agricultural Products Company, Inc. 1982. MRID No. 00096521. Available from EPA. Write to FOI, EPA, Washington, DC 20460.

Fischer-344 rats were randomly assigned to one of four treatment groups (60/sex/group). The treatment groups consisted of animals receiving either 0, 10, 30 or 100 ppm of bromoxynil in their diet. All animals were observed daily for mortality and external signs of toxicity. Blood and urine samples were collected from 10 rats/sex/group after 3, 12, 18 and 24 months of dosing for hematology determinations, urinalysis, and blood determinations. No significant toxicological differences were noted between treated and control groups.

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

UF — An uncertainty factor of 100 was used to account for the inter- and intraspecies differences. An additional UF of 3 was used to account for an insufficient database since the existing database does not indicate that the dog (chronic exposure) will be more sensitive by an order of magnitude.

MF — None

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

Bromoxynil exists as an acid but also as esters (e.g. octanoate). Subchronic studies indicate that there is no toxicological difference between these different forms of bromoxynil. The RfDs for all bromoxynil compounds will be based on the toxicity of bromoxynil alone, unless evidence to the contrary is found.

Data Considered for Establishing the RfD:

- 1) 2-Year Feeding (oncogenic) (bromoxynil) - rat: principal study - see previous description; core grade supplementary
- 2) 13-Week Feeding (bromoxynil octanoate) - dog: NOEL = 5 mg/kg/day (Rhone- Poulenc, 1965)
- 3) 3-Generation Reproduction (bromoxynil) - rat: Reproduction NOEL=300 ppm (15 mg/kg/day); LEL=none (HDT); core grade minimum (Union Carbide, 1978)
- 4) Teratology (bromoxynil) - rat: Fetotoxic and Maternal NOEL=15 mg/kg/day; Fetotoxic and Maternal LEL=35 mg/kg/day (reduced fetal weight; increased uterine deaths, increased number of fetuses with supernumerary 14th rib, and reduced maternal body weight gain; core grade guideline (Union Carbide, 1981)
- 5) Teratology (bromoxynil) - rabbit: Teratogenic NOEL=30 mg/kg/day; Teratogenic LEL=60 mg/kg/day (hydrocephalus, microphthalmia, anophthalmia, and severe defects in ossification of the skull); Maternal NOEL=30 mg/kg/day; Maternal LEL=30 mg/kg/day (body weight loss); Fetotoxic NOEL=30 mg/kg/day; Fetotoxic LEL=60 mg/kg/day lower body weight); core grade guideline (Rhone- Poulenc, 1983)

Data Gap(s): Chronic Dog Feeding Study

I.A.5. Confidence in the Oral RfD

Study — Low
Database — Medium
RfD — Medium

The critical study appears to be only of fair quality and is given a low rating. Additional studies are supportive and of fair to good quality. The 13-week dog feeding study provides a sensitive

toxicological endpoint that supports the 2-year rat study. Hence, the RfD is given a medium confidence rating.

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

Pesticide Registration Files

Agency Work Group Review — 11/06/1985, 09/16/1987

Verification Date — 09/16/1987

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 Bromoxynil octanoate conducted in September 2002 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 — Bromoxynil octanoate

CASRN — 1689-99-2

Not available at this time.

II. Carcinogenicity Assessment for Lifetime Exposure

Substance Name — Bromoxynil octanoate

CASRN — 1689-99-2

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 — Bromoxynil octanoate
CASRN — 1689-99-2

VI.A. Oral RfD References

Rhone-Poulenc, Inc. 1965. MRID No. 00111190. Available from EPA. Write to FOI, EPA, Washington DC 20460.

Rhone-Poulenc, Inc. 1983. MRID No. 00138149. Available from EPA. Write to FOI, EPA, Washington DC 20460.

Union Carbide Agricultural Products Company, Inc. 1978. MRID No. 00064815. Available from EPA. Write to FOI, EPA, Washington, DC 20460.

Union Carbide Agricultural Products Company, Inc. 1981. MRID No. 00116558. Available from EPA. Write to FOI, EPA, Washington, DC 20460.

Union Carbide Agricultural Products Company, Inc. 1982. MRID No. 00096521. 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 — Bromoxynil octanoate
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| Date | Section | Description |
|------------|---------|--|
| 12/23/1987 | I.A. | RfD Withdrawn pending further review |
| 09/07/1988 | 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 — Bromoxynil octanoate
CASRN — 1689-99-2
Last Revised — 03/31/1987

- 1689-99-2
- BENZONITRILE, 3,5-DIBROMO-4-OCTANOYLOXY-
- Bromoxynil octanoate
- BRONATE
- BUCTRIL
- 2,6-DIBROMO-4-CYANOPHENYL OCTANOATE
- 3,5-DIBROMO-4-OCTANOYLOXY-BENZONITRILE

- M B 10731
- RP-16272