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Bromoxynil; CASRN 1689-84-5

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 Bromoxynil

File First On-Line 06/30/1988

Category (section)	Assessment Available?	Last Revised
Oral RfD (I.A.)	yes	06/30/1988
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

CASRN — 1689-84-5

Last Revised — 06/30/1988

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 adverse effects	NOEL: 100 ppm (5 mg/kg/day)	300	1	2E-2 mg/kg/day
2-Year Rat Feeding/ Oncogenic Study	LEL: None			
Union Carbide, 1982				

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

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 data base, since the existing database does not indicate that a second mammalian chronic bioassay 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; therefore, a common RfD considering data on all forms of bromoxynil is appropriate.

Data Considered for Establishing the RfD:

- 1) 2-Year Feeding (oncogenic) - Principal study - see previous description; core grade supplementary
- 2) 3-Generation Reproduction - rat: Reproduction NOEL=300 ppm (15 mg/kg/day) (HDT); core grade minimum (Union Carbide, 1978)
- 3) Teratology - 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 body weight gain (maternal)); core grade guideline (Union Carbide, 1981)
- 4) Teratology - 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=15 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 (Note: A 13-week dog feeding study was done using bromoxynil octanoate; the NOEL was 5 mg/kg/day.)

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 (NOEL = 5 mg/kg/day), which utilized bromoxynil octanoate, provides a sensitive toxicological endpoint that supports the 2- year rat study. Therefore, the database is given a medium rating. Medium 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 — 05/31/1985, 08/05/1986, 09/16/1987

Verification Date — 09/16/1987

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

CASRN — 1689-84-5

Not available at this time.

II. Carcinogenicity Assessment for Lifetime Exposure

Substance Name — Bromoxynil

CASRN — 1689-84-5

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
CASRN — 1689-84-5

VI.A. Oral RfD References

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.

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

VI.B. Inhalation RfD References

None

VI.C. Carcinogenicity Assessment References

None

VII. Revision History

Substance Name — Bromoxynil
CASRN — 1689-84-5

Date	Section	Description
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No entries

VIII. Synonyms

Substance Name — Bromoxynil
CASRN — 1689-84-5
Last Revised — 06/30/1988

- 1689-84-5
- BENZONITRILE, 3,5-DIBROMO-4-HYDROXY-
- BRITTOX
- BROMINAL
- BROMINEX
- BROMINIL
- Bromoxynil
- BROXYNIL
- BUCRIL
- BUCTRIL
- BUCTRIL INDUSTRIAL
- BUTILCHLOROFOS
- CHIPCO BUCTRIL
- CHIPCO CRAB-KLEEN
- 2,6-DIBROMO-4-CYANOPHENOL
- 3,5-DIBROMO-4-HYDROXYBENZONITRILE
- 3,5-DIBROMO-4-HYDROXYPHENYLCYANIDE
- ENT 20852
- 4-HYDROXY-3,5-DIBROMOBENZONITRILE
- M B 10,064
- M B 10731
- MB 10064
- ME4 BROMINAL
- NU-LAWN WEEDER

- OXYTRIL M

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