

2,3-Dichloropropanol; CASRN 616-23-9

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 2,3-Dichloropropanol

File First On-Line 11/01/1990

Category (section)	Assessment Available?	Last Revised
Oral RfD (I.A.)	yes	11/01/1990*
Inhalation RfC (I.B.)	not evaluated	
Carcinogenicity Assessment (II.)	not evaluated	

*A comprehensive review of toxicological studies was completed (2004) - please see section I.A.6 for more information.

I. Chronic Health Hazard Assessments for Noncarcinogenic Effects

I.A. Reference Dose for Chronic Oral Exposure (RfD)

Substance Name — 2,3-Dichloropropanol

CASRN — 616-23-9

Last Revised — 11/01/1990

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
Myocardial degeneration, hepatotoxicity and nephrotoxicity	NOAEL: 10 mg/kg/day	3000	1	3E-3 mg/kg/day
	LOAEL: 35 mg/kg/day			
Rat Oral Subchronic Study				
U.S. EPA, 1989				

*Conversion Factors: None

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

U.S. EPA. 1989. Rat oral subchronic study with 2,3-dichloropropanol. Study conducted by Toxicity Research Laboratory for the Office of Solid Waste, Washington, DC.

Four groups of male and female rats (30/sex/group) were dosed orally with 0, 10, 35, or 100 mg/kg/day of 2,3-dichloropropanol. Rats scheduled for the interim sacrifice were dosed for 28 to 29 days, while the rats scheduled for the final sacrifice were dosed for 91 to 92 days. The toxicological evaluations of this study included body and organ weight changes, food consumption, clinical-pathological evaluations, and histopathological evaluations of target organs. The results of this study indicated significant dose-related hypoactivity and mortality attributed to myocardial degeneration in rats dosed with 100 mg/kg/day. Other organs affected were kidney and liver, showing hypertrophy of both organs and karyomegaly and bile duct proliferations in the liver. Hematological and serum enzyme changes seen in the mid- and high-dose groups in this study were also considered to be treatment-related. Myocardial degeneration,

as well as other toxic effects, were observed to a lesser extent at the intermediate dose of 35 mg/kg/day. The 10 mg/kg dosage produced no apparent adverse effect.

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

UF — An uncertainty factor of 3000 was used: 10 for interspecies extrapolation, 10 for differences in intraspecies sensitivity, and 30 for the lack of chronic toxicity data, data in a second species and reproductive/ developmental studies.

MF — None

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

No other long-term toxicity or reproductive-developmental studies with 2,3- dichloropropanol were available in the literature searched.

I.A.5. Confidence in the Oral RfD

Study — Medium

Database — Low

RfD — Low

The study identified both a NOAEL and a LOAEL for toxicological parameters in both male and female rats and is of medium confidence. Because of the lack of supporting subchronic, chronic, and reproductive/developmental studies, confidence in the database is low. Low 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 — None

Agency Work Group Review — 02/21/1990

Verification Date — 02/21/1990

A comprehensive review of toxicological studies published prior to 2004 was conducted. No new health effects data were identified that would be directly useful in the revision of the existing RfD for 2,3-Dichloropropanol and a change in the RfD is not warranted at this time.

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 — 2,3-Dichloropropanol
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Not available at this time.

II. Carcinogenicity Assessment for Lifetime Exposure

Substance Name — 2,3-Dichloropropanol
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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 — 2,3-Dichloropropanol
CASRN — 616-23-9

VI.A. Oral RfD References

U.S. EPA. 1989. Rat oral subchronic study with 2,3-dichloropropanol. Study conducted by Toxicity Research Laboratory for the Office of Solid Waste, Washington, DC.

VI.B. Inhalation RfC References

None

VI.C. Carcinogenicity Assessment References

None

VII. Revision History

Substance Name — 2,3-Dichloropropanol

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Date	Section	Description
11/01/1990	I.A.	Oral RfD summary on-line
12/03/2002	I.A.6.	Screening-Level Literature Review Findings message has been added.
09/29/2004	I.A.6.	Screening-Level Literature Review Findings message has been removed and replaced by comprehensive literature review conclusions.

VIII. Synonyms

Substance Name — 2,3-Dichloropropanol

CASRN — 616-23-9

Last Revised — 11/01/1990

- 616-23-9
- 1-Propanol, 2,3-dichloro-
- alpha,beta-Dichlorohydrin
- beta-Dichlorohydrin
- GLYCEROL alpha,beta-DICHLOROHYDRIN

- HSDB 2743
- 1-PROPANOL, 2,3-DICHLORO-
- 1,2-DICHLORO-3-PROPANOL
- 1,2-DICHLOROPROPANOL-3
- 2,3-DICHLORO-1-PROPANOL
- 2,3-DICHLOROPROPANOL
- 2,3-DICHLOROPROPYL ALCOHOL