

1,1,2-Trichloropropane; CASRN 598-77-6

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 1,1,2-Trichloropropane

File First On-Line 09/26/1988

Category (section)	Assessment Available?	Last Revised
Oral RfD (I.A.)	yes	09/26/1988*
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 — 1,1,2-Trichloropropane

CASRN — 598-77-6

Last Revised — 09/26/1988

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
Mild lesions in liver, kidney and thyroid	NOEL: 100 mg/L in drinking water converted to 15 mg/kg/day	3000	1	5E-3 mg/kg/day
Rat Oral Subchronic Study	LOAEL: 1000 mg/L converted to 150 mg/kg/day			
Villeneuve et al., 1985				

*Conversion Factors: The equivalent dosages were estimated by the investigators.

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

Villeneuve, D.C., I. Chu, V.E. Secours, M.G. Cotie, G.L. Plaa and V.E. Valli. 1985. Results of a 90-day toxicity study on 1,2,3- and 1,1,2-trichloropropane administered via the drinking water. *Sci. Total Environ.* 47: 421-426.

1,1,2-Trichloropropane (dissolved in Emulphor) was administered to groups of 10 male and 10 female weanling Sprague-Dawley rats in the drinking water at concentrations of 1, 10, 100 or 1000 mg/L for 90 days. These concentrations were equivalent to 0.15, 1.5, 15.0, or 150 mg/kg/day for males and 0.20, 2.0, 20.3, and 203 mg/kg/day for females as determined by the investigators. Two control groups consisted of 10 rats/sex each: one group received tap water, the other received tap water plus Emulphor. Parameters evaluated were clinical appearance, body weight, water consumption, hematology, clinical chemistry, hepatic mixed-function oxidase activity and organ weights. Histological examinations of major organs and tissues were also performed.

There were no effects on water consumption, body weight gain, hematological parameters or enzyme activity. One male at 1000 mg/L and one female at 100 mg/L died of undetermined causes. At 1000 mg/L, males had increased liver weights and females had increased serum cholesterol levels. Histopathological lesions included anisokaryosis and fatty vacuolization in the liver; eosinophilic inclusions, pyknosis, nuclear displacement and glomerular adhesions in the kidney; and follicular collapse, reduction in colloid density and increased epithelial cell height in the thyroid. The lesions were considered mild and occurred only in the 1000 mg/L group. Thus, 1000 mg/L (150 mg/kg/day for males) is the LOAEL and 100 mg/L (15 mg/kg/day for males) is the highest NOAEL.

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

UF — The UF of 3000 allows for uncertainty in the extrapolation of dose levels from laboratory animals to humans (10A), variability in sensitivity among humans (10H), uncertainty in extrapolating from subchronic to chronic exposure (10S), and uncertainty because of the lack of studies assessing reproductive or developmental effects (3D).

MF — None

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

1,1,2-Trichloropropane has not been studied for teratogenicity or other reproductive effects or chronic toxicity. Smyth et al. (1962) reported an oral LD50 of 1.23 g/kg for rats. An inhalation exposure to 1,1,2- trichloropropane at 2000 ppm (12 g/cu.m) for 4 hours killed three of six rats. The dermal LD50 in rabbits was 14.1 mL/kg.

I.A.5. Confidence in the Oral RfD

Study — Medium

Database — Low

RfD — Low

Confidence in the study is medium because although it was a well-conducted study by a relevant route and defined both a NOAEL and a LOAEL, only 10 rats/group were used in this subchronic study. As there are no supporting studies, confidence in the database and the RfD is low.

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

Source Document — U.S. EPA, 1987

Limited peer review and extensive Agency-wide review 1987.

Other EPA Documentation — None

Agency Work Group Review — 09/17/1987

Verification Date — 09/17/1987

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 1,1,2-Trichloropropane 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 — 1,1,2-Trichloropropane

CASRN — 598-77-6

Not available at this time.

II. Carcinogenicity Assessment for Lifetime Exposure

Substance Name — 1,1,2-Trichloropropane

CASRN — 598-77-6

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 — 1,1,2-Trichloropropane

CASRN — 598-77-6

VI.A. Oral RfD References

Smyth, H.F., C.P. Carpenter, C.S. Weil, U.C. Pozzani and J.A. Striegel. 1962. Range-finding toxicity data: List VI. *Ind. Hyg. J.* 23: 95-107.

U.S. EPA. 1987. Health and Environmental Effects Document on Trichloropropanes. Prepared by the Office of Health and Environmental Assessment, Environmental Criteria and Assessment Office, Cincinnati, OH for the Office of Solid Waste and Emergency Response, Washington, DC.

Villeneuve, D.C., I. Chu, V.E. Secours, M.G. Cotie, G.L. Plaa and V.E. Valli. 1985. Results of a 90-day toxicity study on 1,2,3- and 1,1,2-trichloropropane administered via the drinking water. *Sci. Total Environ.* 47: 421-426.

VI.B. Inhalation RfC References

None

VI.C. Carcinogenicity Assessment References

None

VII. Revision History

Substance Name — 1,1,2-Trichloropropane

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Date	Section	Description
09/26/1988	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 — 1,1,2-Trichloropropane

CASRN — 598-77-6

Last Revised — 09/26/1988

- 598-77-6
- PROPANE, 1,1,2-TRICHLORO-
- 1,1,2-Trichloropropane
- Trichloropropane, 1,1,2-