

## Methanol; CASRN 67-56-1

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 Methanol

**File First On-Line 09/07/1988**

Category (section)	Status	Last Revised
Oral RfD Assessment (I.A.)	on-line	07/01/1993
Inhalation RfC Assessment (I.B.)	no data	
Carcinogenicity Assessment (II.)	no data	

## I. Chronic Health Hazard Assessments for Noncarcinogenic Effects

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

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Last Revised — 07/01/1993

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
<b>Increased SAP and SGPT, and decreased brain weight</b>	NOEL: 500 mg/kg/day LOAEL: 2500 mg/kg/day	1000	1	5E-1 mg/kg/day
<b>Rat Oral Subchronic Study</b>				
<b>U.S. EPA, 1986</b>				

\*Conversion Factors: None

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

U.S. EPA. 1986. Rat oral subchronic toxicity study with methanol. Office of Solid Waste, Washington, DC.

No pertinent toxicity data regarding methanol were located in the available literature. Therefore, the U.S. EPA Office of Solid Waste, under the RCRA Land Disposal Ban, sponsored the 90-day subchronic testing of methanol in rats. Sprague-Dawley rats (30/sex/dose) were gavaged daily with 0, 100, 500, or 2500 mg/kg/day of methanol. Six weeks after dosing, 10 rats/sex/dose group were subjected to interim sacrifice while the remaining rats continued on the dosing regimen until the final sacrifice (90 days).

This study generated data on weekly body weights and food consumption, clinical signs of toxicity, ophthalmological evaluations, mortality, blood and urine chemistry, and gross and microscopic evaluations. There were no differences between dosed animals and controls in body weight gain, food consumption, gross or microscopic evaluations. Elevated levels of SGPT, SAP, and increased, but not statistically significant, liver weights in both male and female rats suggest possible treatment-related effects in rats dosed with 2500 mg methanol/kg/day despite

the absence of supportive histopathologic lesions in the liver. Brain weights of both high-dose group males and females were significantly less than those of the control group. Based on these findings, 500 mg/kg/day of methanol is considered a NOAEL in rats.

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

UF — An uncertainty factor (10A) was used to account for interspecies extrapolation, (10H) for range of sensitivity within the human population to xenobiotics and (10S) to account for extrapolation from subchronic to chronic exposure.

MF — None

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

A subchronic dog inhalation study (Sayers et al., 1942) was reviewed, but is inappropriate for deriving the oral RfD because of the limited number of animals and dose groups, and because of uncertainties in route-to-route extrapolation.

### **I.A.5. Confidence in the Oral RfD**

Study — Medium

Database — Low

RfD — Medium

The principal study was well-designed and provided adequate toxicological endpoints, but the method of administration was not ideal. The overall data base is weak, lacking data on reproductive, developmental, or other toxicological endpoints. The RfD is given a medium confidence rating because of the strengths of the principal study.

### **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 — U.S. EPA, 1986

Agency Work Group Review — 05/15/1986, 01/20/1988

Verification Date — 01/20/1988

### **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](mailto:hotline.iris@epa.gov) (internet address).

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### **I.B. Reference Concentration for Chronic Inhalation Exposure (RfC)**

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Not available at this time.

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## **II. Carcinogenicity Assessment for Lifetime Exposure**

Substance Name — Methanol  
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Not available at this time.

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**III. [reserved]**

**IV. [reserved]**

**V. [reserved]**

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## **VI. Bibliography**

Substance Name — Methanol  
CASRN — 67-56-1  
Last Revised — 11/01/1989

## VI.A. Oral RfD References

Sayers, R.R., W.P. Yant, H.H. Schrenk, et al. 1942. Methanol poisoning. I. Exposure of dogs to 450-500 ppm methanol vapor in air. Report of Investigations, U.S. Dept. Interior - Bureau of Mines, R.I. 3617. February. p. 1-10.

U.S. EPA. 1986. Rat oral subchronic toxicity study with methanol. Office of Solid Waste, Washington, DC.

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## VI.B. Inhalation RfC References

None.

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## VI.C. Carcinogenicity Assessment References

None.

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## VII. Revision History

Substance Name — Methanol  
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Date	Section	Description
09/07/1988	I.A.	Oral RfD summary on-line
10/01/1989	I.B.	Inhalation RfD now under review
11/01/1989	VI.	Bibliography on-line
01/01/1991	I.A.	Text edited

Date	Section	Description
01/01/1992	I.A.7.	Secondary contact changed
01/01/1992	IV.	Regulatory Action section on-line
07/01/1993	I.A.6.	Other EPA Documentation added
08/01/1995	I.B.	EPA's RfD/RfC and CRAVE workgroups were discontinued in May, 1995. Chemical substance reviews that were not completed by September 1995 were taken out of IRIS review. The IRIS Pilot Program replaced the workgroup functions beginning in September, 1995.
04/01/1997	III., IV., V.	Drinking Water Health Advisories, EPA Regulatory Actions, and Supplementary Data were removed from IRIS on or before April 1997. IRIS users were directed to the appropriate EPA Program Offices for this information.
02/22/2001	I., II.	This chemical is being reassessed under the IRIS Program.

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## VIII. Synonyms

Substance Name — Methanol

CASRN — 67-56-1

Last Revised — 09/07/1988

- 67-56-1
- carbinol
- Methanol
- methyl alcohol
- wood alcohol
- wood-spirit