

## Benzaldehyde; CASRN 100-52-7

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 Benzaldehyde

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

Category (section)	Assessment Available?	Last Revised
<b>Oral RfD (I.A.)</b>	yes	09/07/1988
<b>Inhalation RfC (I.B.)</b>	not evaluated	
<b>Carcinogenicity Assessment (II.)</b>	not evaluated	

## I. Chronic Health Hazard Assessments for Noncarcinogenic Effects

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

Substance Name — Benzaldehyde

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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
Forestomach lesions, kidney toxicity	NOEL: 200 mg/kg/day converted to 143 mg/kg/day	1000	1	1E-1 mg/kg/day
Rat Oral Toxicity Study (subchronic)	LOAEL: 400 mg/kg/day			
<b>Kluwe et al., 1983</b>				

\*Conversion Factors: Doses adjusted for gavage schedule of 5 days/week.

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

Kluwe, W.M., C.A. Montgomery, H.D. Giles and J.D. Prejeau. 1983. Encephalopathy in rats and nephropathy in rats and mice after subchronic oral exposure to benzaldehyde. Food Chem. Toxicol. 21(3):245-250.

Kluwe et al. (1983) orally treated groups of 10 mice of each sex with 0, 75, 150, 300, 600 or 1200 mg/kg/day benzaldehyde, and groups of 10 rats of each sex with 0, 50, 100, 200, 400 or 800 mg/kg/day benzaldehyde, 5 days/week for 13 weeks by corn oil gavage. Administration of 600 mg/kg/day in mice was associated with renal tubular necrosis, and administration of 400 mg/kg/day to rats resulted in forestomach hyperplasia and hyperkeratosis. Using the rat NOEL of 200 mg/kg/day, multiplying by 5 days/7 days, and dividing by an uncertainty factor of 1000, results in an RfD of 0.1 mg/kg/day.

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

UF — The UF of 1000 includes factors of 10 for extrapolation from subchronic to chronic exposure, 10 for interspecies extrapolation, and 10 for consideration of sensitive human subgroups.

MF — None

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

Additional pertinent data regarding the chronic, subchronic or reproductive effects of oral or inhalation exposure to benzaldehyde, were not located in the available literature. The NTP (1986) assayed benzaldehyde in rat and mouse 2-year oral studies, and is currently doing chronic histopathology.

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

Study — Medium

Database — Low

RfD — Low

Confidence in the study was medium because, although two species were studied at five dose levels each and a NOEL and a LOAEL were defined, dosing was subchronic. The absence of appropriate supporting studies makes confidence in the database low. Confidence in the RfD is low because of these limitations.

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

Source Document — U.S. EPA, 1985

Limited peer review and extensive agency-wide review, 1985.

Other EPA Documentation — None

Agency Work Group Review — 10/15/1987

Verification Date — 10/15/1987

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 Benzaldehyde conducted in August 2003 did not identify any critical new studies. IRIS users who know of important new studies may provide that information to the IRIS Hotline at [hotline.iris@epa.gov](mailto: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](mailto:hotline.iris@epa.gov) (internet address).

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

Substance Name — Benzaldehyde  
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Not available at this time.

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

Substance Name — Benzaldehyde  
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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.

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**III. [reserved]**

**IV. [reserved]**

**V. [reserved]**

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## **VI. Bibliography**

Substance Name — Benzaldehyde  
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## VI.A. Oral RfD References

Kluwe, W.M., C.A. Montgomery, H.D. Giles and J.D. Prejeau. 1983. Encephalopathy in rats and nephropathy in rats and mice after subchronic oral exposure to benzaldehyde. Food Chem. Toxicol. 21(3):245-250.

NTP (National Toxicology Program). 1986. Benzaldehyde. Management Status Report. Research Triangle Park, NC.

U.S. EPA. 1985. Health and Environmental Effects Profile for Benzaldehyde. Prepared by the Office of Health and Environmental Assessment, Environmental Criteria and Assessment Office, Cincinnati, OH for the 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 — Benzaldehyde  
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Date	Section	Description
09/07/1988	I.A.	Oral RfD summary on-line
10/28/2003	I.A.6.	Screening-Level Literature Review Findings message has been added.

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## VIII. Synonyms

Substance Name — Benzaldehyde

CASRN — 100-52-7

Last Revised — 09/07/1988

- 100-52-7
- artificial-almond-oil
- Benzaldehyde
- benzene-carbonal
- benzoic aldehyde