

Tetraethyl lead; CASRN 78-00-2

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 Tetraethyl lead

File First On-Line 01/31/1987

Category (section)	Assessment Available?	Last Revised
Oral RfD (I.A.)	yes	01/31/1987
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 — Tetraethyl lead

CASRN — 78-00-2

Last Revised — 01/31/1987

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
Histopathology of liver and thymus	NOAEL: none	10,000	1	1E-7 mg/kg/day
Rat Subchronic Study	LOAEL: 1.7 ug/kg/day converted to 0.0012 mg/kg/day			
Schepers, 1964				

*Conversion Factors: 5 days/7 days; thus, 1.7 ug/kg/day x 5 days/7 days = 1.2 ug/kg/day

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

Schepers, G.W. 1964. Tetraethyl and tetramethyl lead. Arch. Environ. Health. 8: 277-295.

In a 20-week study, Schepers (1964) administered tetraethyl lead in peanut oil by gavage to groups of 12 CD rats (6/sex) at 1.7 and 170 ug/kg/bw 5 days/week. Gross observations revealed swollen livers and fatty plaques in the thymus at both dose groups. Histologic preparations revealed hepatocyte vacuolization, cytoplasmic degeneration and neuronal damage among low-dose rats. Rats exposed to the higher dose developed similar, but more severe, histopathologies. Based on these findings, a LOAEL of 1.2 ug/kg/day (1.7 ug/kg/day x 5 days/7 days) was determined.

A subchronic inhalation study by Davis et al. (1963) in rats and dogs supports these findings. However, the equivalent oral doses derived from this study are substantially higher than the LOAEL derived from the Schepers (1964) study. Therefore, a human RfD of 0.0001 ug/kg/day was derived based on the LOAEL of 1.2 ug/kg/day from Schepers (1964) and on a standard scaling factor of 10,000.

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

UF — The uncertainty factor of 10,000 represents 10 to extrapolate from animal to human, 10 to convert subchronic to chronic exposure, and 10 to protect for sensitive humans, and an additional factor of 10 to convert a LOAEL to a NOAEL.

MF — None

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

The database contained limited long-term oral studies, as well as limited subchronic inhalation and oral data. Reproductive, carcinogenicity, and teratogenicity data are available, but are inconclusive. Limited epidemiologic data are also available.

I.A.5. Confidence in the Oral RfD

Study — Medium

Database — Medium

RfD — Medium

The chosen study is given medium to low confidence because, although only a few animals/sex/dose were tested, a good histopathologic exam was conducted and a dose-severity was observed. The database was considered to have medium to low confidence because some supporting information was available. Confidence in the RfD can also be considered medium to low.

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 — 08/05/1985

Verification Date — 08/05/1985

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 Tetraethyl lead conducted in September 2002 identified one or more significant new studies. IRIS users may request the references for those studies from the IRIS Hotline at 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 (internet address).

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

Substance Name — Tetraethyl lead
CASRN — 78-00-2

Not available at this time.

II. Carcinogenicity Assessment for Lifetime Exposure

Substance Name — Tetraethyl lead
CASRN — 78-00-2

This substance/agent has not undergone a complete evaluation and determination under US EPA's IRIS program for evidence of human carcinogenic potential.

VI. Bibliography

Substance Name — Tetraethyl lead
CASRN — 78-00-2

VI.A. Oral RfD References

Davis, R.K., A.W. Horton, E.E. Larson and K.L. Stemmer. 1963. Inhalation of tetramethyllead and tetraethyllead. Arch. Environ. Health. 6: 473-479.

Schepers, G.W. 1964. Tetraethyl and tetramethyl lead. Arch. Environ. Health. 8: 277-295.

VI.B. Inhalation RfC References

None

VI.C. Carcinogenicity Assessment References

None

VII. Revision History

Substance Name — Tetraethyl lead

CASRN — 78-00-2

Date	Section	Description
12/03/2002	I.A.6.	Screening-Level Literature Review Findings message has been added.

VIII. Synonyms

Substance Name — Tetraethyl lead

CASRN — 78-00-2

Last Revised — 01/31/1987

- 78-00-2
- Lead, Tetraethyl-
- NCI-C54988
- Plumbane, Tetraethyl-
- TEL
- Tetraethyl Lead
- Tetraethylplumbane