Octabromodiphenyl ether; CASRN 32536-52-0

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 Octabromodiphenyl ether

File First On-Line 03/31/1987

Category (section)	Assessment Available?	Last Revised
Oral RfD (I.A.)	yes	03/31/1987
Inhalation RfC (I.B.)	not evaluated	
Carcinogenicity Assessment (II.)	yes	08/01/1990

I. Chronic Health Hazard Assessments for Noncarcinogenic Effects

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

Substance Name — Octabromodiphenyl ether
CASRN — 32536-52-0
Last Revised — 03/31/1987

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
Induction of hepatic enzymes; liver histopathology **Subchronic, Rat, Oral (gavage)** **Carlson, 1980**	NOAEL: 3.13 umol/kg/day (2.51 mg/kg/day) LOAEL: 6.25 umol/kg/day (5 mg/kg/day)	1000	1	3E-3 mg/kg/day

* Conversion Factors: 1 umol = 0.8014 mg

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

Carlson, G.P. 1980. Induction of xenobiotic metabolism in rats by brominated diphenyl ethers administered for 90 days. Toxicol. Lett. 6: 207-212.

Carlson (1980) administered octabromodiphenyl ether (commercial grade) in corn oil by gavage to groups of six male Sprague-Dawley rats weighing 200 to 250 g for 90 days. Two dosing regimens were used: a high-dose series of 0, 6.25, 12.5, or 25 umol/kg/day (equivalent to 0, 5.01, 10.02, or 20.04 mg/kg/day, respectively) and a low-dose series of 0, 0.78, 1.56, or 3.13 umol/kg/day (equivalent to 0, 0.62, 1.25, or 2.51 mg/kg/day, respectively). Liver enzyme induction occurred at all dose levels, and some of these changes were persistent, lasting for 30-60 days after the cessation of treatment. No histologic liver abnormalities were observed in rats administered the low-dose series. Histologic evaluation was not performed on the high-dose rats; thus, these dose levels should be considered as possible AELs (adverse-effect levels). Since the relevance of hepatic enzyme induction to health effects is not established, this endpoint, in the absence of a histopathology evaluation, is considered here not to be adverse; thus, the highest NOAEL for octabromodiphenyl ether is considered to be 2.51 mg/kg/day.

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

UF — The uncertainty factor of 1000 reflects 10 for both intraspecies and interspecies variability to the toxicity of this chemical in lieu of specific data, and 10 for extrapolation of a subchronic effect level to its chronic equivalent.

MF — None

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

None.

I.A.5. Confidence in the Oral RfD

Study — Low
Database — Low
RfD — Low

Although six dose levels were used in the critical study, the study was of short duration, only one sex and one species were exposed, there were only six animals/group, and few toxic endpoints were examined. The study also did not establish a definitive LOAEL or NOAEL. Supporting evidence is extremely limited. Thus, confidence in the chosen study is low. The supporting evidence for the database is also extremely limited; therefore, 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 — U.S. EPA, 1983

Other EPA Documentation — None

Agency Work Group Review — 10/09/1985, 05/15/1986

Verification Date — 05/15/1986

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 octabromodiphenyl ether conducted in August 2003 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 — Octabromodiphenyl ether
CASRN — 32536-52-0

Not available at this time.

II. Carcinogenicity Assessment for Lifetime Exposure

Substance Name — Octabromodiphenyl ether
CASRN — 32536-52-0
Last Revised — 08/01/1990

Section II provides information on three aspects of the carcinogenic assessment for the substance in question; the weight-of-evidence judgment of the likelihood that the substance is a human carcinogen, and quantitative estimates of risk from oral exposure and from inhalation exposure. The quantitative risk estimates are presented in three ways. The slope factor is the result of application of a low-dose extrapolation procedure and is presented as the risk per (mg/kg)/day. The unit risk is the quantitative estimate in terms of either risk per ug/L drinking water or risk per ug/cu.m air breathed. The third form in which risk is presented is a drinking water or air concentration providing cancer risks of 1 in 10,000, 1 in 100,000 or 1 in 1,000,000. The rationale and methods used to develop the carcinogenicity information in IRIS are described in The Risk Assessment Guidelines of 1986 (EPA/600/8-87/045) and in the IRIS Background Document. IRIS summaries developed since the publication of EPA's more recent Proposed Guidelines for Carcinogen Risk Assessment also utilize those Guidelines where indicated (Federal Register 61(79):17960-18011, April 23, 1996). Users are referred to Section I of this IRIS file for information on long-term toxic effects other than carcinogenicity.

II.A. Evidence for Human Carcinogenicity

II.A.1. Weight-of-Evidence Characterization

Classification — D; not classifiable as to human carcinogenicity

Basis — No human data and no animal data available.

II.A.2. Human Carcinogenicity Data

None.

II.A.3. Animal Carcinogenicity Data

None.

II.A.4. Supporting Data for Carcinogenicity

Octabromodiphenyl ether is structurally-related to decabromodiphenyl ether, a possible human carcinogen.

II.B. Quantitative Estimate of Carcinogenic Risk from Oral Exposure

None.

II.C. Quantitative Estimate of Carcinogenic Risk from Inhalation Exposure

None.

II.D. EPA Documentation, Review, and Contacts (Carcinogenicity Assessment)

II.D.1. EPA Documentation

Source Document — U.S. EPA, 1984

The 1984 Health and Environmental Effects Profile for Brominated Diphenyl Ethers has received Agency Review.

II.D.2. EPA Review (Carcinogenicity Assessment)

Agency Work Group Review — 06/15/1990

Verification Date — 06/15/1990

Screening-Level Literature Review Findings — A screening-level review conducted by an EPA contractor of the more recent toxicology literature pertinent to the cancer assessment for octabromodiphenyl ether 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 or 202-566-1676.

II.D.3. EPA Contacts (Carcinogenicity Assessment)

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).

III. [reserved]
IV. [reserved]
V. [reserved]

VI. Bibliography

Substance Name — Octabromodiphenyl ether
CASRN — 32536-52-0

VI.A. Oral RfD References

Carlson, G.P. 1980. Induction of xenobiotic metabolism in rats by bromi- nated diphenyl ethers administered for 90 days. Toxicol. Lett. 6: 207-212.

U.S. EPA. 1983. Health and Environmental Effects Profile for Brominated Diphenyl Ethers. Prepared by the Office of Environmental Health and Assess- ment, Environmental Criteria and Assessment Office, Cincinnati, OH for the Office of Solid Waste, Washington, DC.

VI.B. Inhalation RfC References

None

VI.C. Carcinogenicity Assessment References

U.S. EPA. 1984. Health and Environmental Effects Profile for Brominated Diphenyl Ethers. 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.

VII. Revision History

Substance Name — Octabromodiphenyl ether
CASRN — 32536-52-0

Date	Section	Description
08/01/1990	II.	Carcinogen assessment on-line
10/28/2003	I.A.6, II.D.2	Screening-Level Literature Review Findings message has been added.

VIII. Synonyms

Substance Name — Octabromodiphenyl ether
CASRN — 32536-52-0
Last Revised — 03/31/1987

- 32536-52-0
- Benzene, 1,1'-oxybis-, octabromo deriv.
- Bromkal 79-8DE
- DE 71
- DE 79
- FR 143
- Octabromodiphenyl ether
- Phenyl ether, octabromo deriv.
- Tardex 80