Acenaphthene; CASRN 83-32-9

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 Acenaphthene

File First On-Line 11/01/1990

Category (section)	Assessment Available?	Last Revised
Oral RfD (I.A.)	yes	11/01/1990
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)

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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
Hepatotoxicity **Mouse Oral Subchronic Study** **U.S. EPA, 1989**	NOAEL: 175 mg/kg/day LOAEL: 350 mg/kg/day	3000	1	6E-2 mg/kg/day

*Conversion Factors: None

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

U.S. EPA. 1989. Mouse oral subchronic study with acenaphthene. Study conducted by Hazelton Laboratories, Inc., for the Office of Solid Waste, Washington, DC.

Four groups of CD-1 mice (20/sex/group) were gavaged daily with 0, 175, 350, or 700 mg/kg/day acenaphthene for 90 days. The toxicological evaluations of this study included body weight changes, food consumption, mortality, clinical pathological evaluations (including hematology and clinical chemistry), organ weights and histopathological evaluations of target organs. The results of this study indicated no treatment-related effects on survival, clinical signs, body weight changes, total food intake, and ophthalmological alterations. Liver weight changes accompanied by microscopic alterations (cellular hypertrophy) were noted in both mid- and high-dose animals and seemed to be dose-dependent. Additionally, high-dose males and mid- and high-dose females showed significant increases in cholesterol levels. Although increased liver weights, without accompanying microscopic alterations or increased cholesterol levels, were also observed at the low dose, this change was considered to be adaptive and was not considered adverse. The LOAEL is 350 mg/kg/day based on hepatotoxicity); the NOAEL is 175 mg/kg/day.

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

UF — An uncertainty factor of 3000 reflects 10 each for inter- and intraspecies variability, 10 for the use of a subchronic study for chronic RfD derivation, and 3 for the lack of adequate data in a second species and reproductive/developmental data.

MF — None

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

Reshetyuk et al. (1970) examined the comparative toxicity of acenaphthene and acenaphthylene with respect to naphthalene. On intraperitoneal administration in rats (species/number/sex unspecified), naphthalene was more toxic than acenaphthene and acenaphthylene. Two LD\50? values (0.6 and 1.7 g/kg) were reported, but it is unclear to which of the three chemicals these values belonged. Intraperitoneal and intratracheal administration of naphthalene, acenaphthene, and acenaphthylene produced monotypic effects in the form of vascular disorders, and degeneration in the internal organs and central nervous system. Inflammatory changes were also observed in the lungs; the degree was the same for all three substances. Splenic degeneration was noted among the unscheduled deaths in this study. Reshetyuk et al. (1970) concluded that chronic inhalation of acenaphthene and acenaphthylene had more pronounced toxic effects than naphthalene.

Gershbein (1975) exposed partially hepatectomized rats to 15 mg/kg acenaphthene in the diet for 7 days. The only parameters used to assess toxicity were body weight, absolute liver weight, and liver regeneration. Information on histopathologic alterations and food intake is needed to evaluate the adversity of decreased body weight gain and increased liver weight observed in this study. Increased liver regeneration was reported. Because of its inherent deficiencies, this study is not considered adequate for RfD derivation.

Knobloch et al. (1969) administered 2 g/kg acenaphthene orally to rats and mice for 32 days. Weight loss and mild histopathological alterations in the liver and kidney were observed. It is unclear whether experimental controls were used.

I.A.5. Confidence in the Oral RfD

Study — Low
Database — Low
RfD — Low

Confidence in the study is low, because the observed effects were adaptive and not considered adverse. Confidence in the database is low because of the lack of supporting chronic toxicity and developmental/reproductive studies. Low confidence in the RfD follows.

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, 1980

Agency Work Group Review — 11/15/1989

Verification Date — 11/15/1989

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 — Acenaphthene
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Not available at this time.

II. Carcinogenicity Assessment for Lifetime Exposure

Substance Name — Acenaphthene
CASRN — 83-32-9

Not available at this time.

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

VI. Bibliography

Substance Name — Acenaphthene
CASRN — 83-32-9

VI.A. Oral RfD References

Gershbein, L.L. 1975. Liver regeneration as influenced by the structure of aromatic and heterocyclic compounds. Res. Commun. Chem. Pathol. Pharmacol. 11: 445.

Knobloch, K., S. Szendzikowski and A. Slusarczyk-Zalobona. 1969. Acute and subacute toxicity of acenaphthene and acenaphthylene. Med. Pracy. 20: 210-222. (Pol.) (Cited in U.S. EPA, 1980)

Reshetyuk, A.L, E.I. Talakina and P.A. En'yakova. 1970. Toxicological evaluation of acenaphthene and acenaphthylene. Gig. Tr. Prof. Zabol. 14: 46-47.

U.S. EPA. 1980. Ambient Water Quality Criteria Document for Acenaphthene. Prepared by the Office of Health and Environmental Assessment, Environmental Criteria and Assessment Office, Cincinnati, OH for the Office of Water Regulation and Standards, Washington, DC. EPA-440/5-80-015. NTIS PB81-117269.

U.S. EPA. 1989. Mouse Oral Subchronic Study with Acenaphthene. Study conducted by Hazelton Laboratories, Inc., for the Office of Solid Waste, Washington, DC.

VI.B. Inhalation RfC References

None

VI.C. Carcinogenicity Assessment References

None

VII. Revision History

Substance Name — Acenaphthene
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Date	Section	Description
11/01/1990	I.A.	Oral RfD summary on-line

VIII. Synonyms

Substance Name — Acenaphthene
CASRN — 83-32-9
Last Revised — 11/01/1990

- 83-32-9
- Acenaphthylene, 1,2-dihydro-
- Acenaphthene
- HSDB 2659
- Naphthyleneethylene
- NSC 7657
- PERI-ETHYLENENAPHTHALENE
- 1,2-DIHYDROACENAPHTHYLENE
- 1,8-ETHYLENENAPHTHALENE