



Toxicological Summary for: Acenaphthene

CAS: 83-32-9

Synonyms: 1,2-Dihydroacenaphthylene (IUPAC), 1,8-Ethylenenaphthalene,
peri-Ethylenenaphthalene, Naphthyleneethylene

Acute Non-Cancer Health Based Value (nHBV_{Acute}) = Not Derived (Insufficient Data)

Short-term Non-Cancer Health Based Value (nHBV_{Short-term}) = Not Derived (Insufficient Data)

Subchronic Non-Cancer Health Based Value (nHBV_{Subchronic}) = 200 µg/L

(Reference Dose, mg/kg-d) x (Relative Source Contribution) x (Conversion Factor)
(Subchronic Intake Rate, L/kg-d)

$$= \frac{(0.070 \text{ mg/kg-d}) \times (0.2^*) \times (1000 \text{ µg/mg})}{(0.070^{**} \text{ L/kg-d})}$$

$$= 200 \text{ µg/L}$$

*Relative Source Contribution: MDH 2008, Section IV.E.1.

**Intake Rate: MDH 2008, Section IV.E.1 and US EPA 2011, Exposure Factors Handbook, Tables 3-1 and 3-81.

Reference Dose/Concentration:	0.070 mg/kg-d (CD-1 mice)
Source of toxicity value:	MDH, 2015
Point of Departure (POD):	162 mg/kg-d BMDL ₁₀ (MDH derived, based on U.S. Environmental Protection Agency, 1989)
Human Equivalent Dose (MDH, 2011):	POD x DAF = 162 x 0.13 = 21 mg/kg-d
Total uncertainty factor:	300
Uncertainty factor allocation:	3 for interspecies differences (for toxicodynamics), 10 for intraspecies variability, and 10 for database uncertainty due to a lack of reproductive/developmental studies and a lack of testing in a second species
Critical effect(s):	Increased relative liver weight in female mice
Co-critical effect(s):	Decreased relative adrenal weight
Additivity endpoint(s):	Adrenal, Hepatic (liver) system

Chronic Non-Cancer Health Based Value (nHBV_{Chronic}) = 100 µg/L

(Reference Dose, mg/kg-d) x (Relative Source Contribution) x (Conversion Factor)
(Chronic Intake Rate, L/kg-d)

$$= \frac{(0.021 \text{ mg/kg-d}) \times (0.2^*) \times (1000 \text{ } \mu\text{g/mg})}{(0.044^{**} \text{ L/kg-d})}$$

$$= 95.5 \text{ rounded to } \mathbf{100 \text{ } \mu\text{g/L}}$$

*Relative Source Contribution: MDH 2008, Section IV.E.1.

**Intake Rate: MDH 2008, Section IV.E.1 and US EPA 2011, Exposure Factors Handbook, Tables 3-1 and 3-81.

Reference Dose/Concentration:	0.021 mg/kg-d (CD-1 mice)
Source of toxicity value:	MDH, 2015
Point of Departure (POD):	162 mg/kg-d BMDL ₁₀ (MDH derived, based on U.S. Environmental Protection Agency, 1989, subchronic study)
Human Equivalent Dose (MDH, 2011):	POD x DAF = 162 x 0.13 = 21 mg/kg-d
Total uncertainty factor:	1000
Uncertainty factor allocation:	3 for interspecies differences (for toxicodynamics), 10 for intraspecies variability, 3 for extrapolation from a subchronic to a chronic study, and 10 for database uncertainty due to a lack of reproductive/developmental studies and a lack of testing in a second species
Critical effect(s):	Increased relative liver weight in female mice
Co-critical effect(s):	Decreased relative adrenal weight
Additivity endpoint(s):	Adrenal, Hepatic (liver) system

Cancer Health Based Value (cHBV) = Not Applicable

Volatile: Yes (moderate)

Summary of Guidance Value History:

Acenaphthene has a 1993 chronic HRL of 400 µg/L. In addition, a Pesticide Rapid Assessment Result of 40 µg/L was derived in 2014 and was lower than the HRL due to the conservative rapid assessment method (MDH 2014). Subchronic and Chronic HBVs of 200 µg/L and 100 µg/L were derived in 2015. The 2015 Chronic HBV is 4 times lower than the 1993 HRL as the result of: 1) using updated risk assessment methodology, including use of body weight scaling and updated water intake rates, and 2) rounding to one significant digit. In 2016 MDH updated the intake rate values used to derive guidance values. The updated intake rates did not result in changes to the values derived in 2015. MDH intends to re-evaluate guidance values on a five year cycle in order to keep guidance values current with scientific knowledge. Under this process acenaphthene would undergo re-evaluation in 2020.

Summary of toxicity testing for health effects identified in the Health Standards Statute (144.0751):

Even if testing for a specific health effect was not conducted for this chemical, information about that effect might be available from studies conducted for other purposes. MDH has considered the following information in developing health protective guidance.

	Endocrine	Immunotoxicity	Development	Reproductive	Neurotoxicity
Tested for specific effect?	No	No	No	No	No
Effects observed?	Yes ¹	No	No	No	No

Comments on extent of testing or effects:

¹ A study in mice reported that the adrenal gland weight was decreased at dose levels more than 325 times the subchronic reference dose. Hormone levels were not assessed.

References Consulted During Review:

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