



Toxicological Summary for: Pyrene

CAS: 129-00-0

Synonyms: Benzo[d,e,f]phenanthrene **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}) = 90 µg/L

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

$$= \frac{(0.033 \text{ mg/kg-d}) \times (0.2^*) \times (1000 \text{ µg/mg})}{(0.070^{**} \text{ L/kg-d})}$$

$$= 94.3 \text{ rounded to } \mathbf{90 \text{ µg/L}}$$

*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:	0.033 mg/kg-d (CD-1 mice)
Source of toxicity value:	MDH, 2015
Point of Departure (POD):	75 mg/kg-d NOAEL (U. S. Environmental Protection Agency, 1989)
Human Equivalent Dose (MDH, 2011):	POD x DAF = 75 x 0.13 = 10 mg/kg-d
Total uncertainty factor:	300
Uncertainty factor allocation:	3 for interspecies differences (for toxicodynamics); 10 for intraspecies variability; 10 for database uncertainty due to lack of reproductive/developmental studies and a lack of studies in a second species
Critical effect(s):	Nephropathy in female mice, decreased kidney weight
Co-critical effect(s):	N/A
Additivity endpoint(s):	Renal (kidney) system

Chronic Non-Cancer Health Based Value (nHBV) = 50 µg/L

$$\frac{(\text{Reference Dose, mg/kg-d}) \times (\text{Relative Source Contribution}) \times (\text{Conversion Factor})}{(\text{Chronic Intake Rate, L/kg-d})}$$
$$= \frac{(0.010 \text{ mg/kg-d}) \times (0.2^*) \times (1000 \text{ µg/mg})}{(0.044^{**} \text{ L/kg-d})}$$
$$= 45.5 \text{ rounded to } \mathbf{50 \text{ µg/L}}$$

*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:	0.010 mg/kg-d (CD-1 mice)
Source of toxicity value:	MDH, 2015
Point of Departure (POD):	75 mg/kg-d NOAEL (U.S. Environmental Protection Agency, 1989, subchronic study)
Human Equivalent Dose (MDH, 2011):	POD x DAF = 75 x 0.13 = 10 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 study to a chronic study due to the lack of severity of the critical effect; 10 for database uncertainty due to lack of reproductive and developmental studies and a lack of studies in a second species
Critical effect(s):	Nephropathy in female mice, decreased kidney weight
Co-critical effect(s):	N/A
Additivity endpoint(s):	Renal (kidney) system

Cancer Health Based Value (cHBV) = Not Applicable

Volatile: Yes (Moderate)

Summary of Guidance Value History:

Pyrene has a 1993 chronic HRL of 200 µg/L. In addition, a Pesticide Rapid Assessment Value of 20 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 90 µg/L and 50 µg/L were derived in 2015. The 2015 Chronic HBV is 4 times lower than the 1993 HRL as a result of: 1) the use of new 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. Use of updated intake rates did not result in any changes to the Subchronic or Chronic nHBV 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 pyrene 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?	No	No	No	No	No

Comments on extent of testing or effects: N/A

References Consulted During Review:

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- U.S. Environmental Protection Agency - Regional Screening Tables. Mid-Atlantic Risk Assessment - Regional Screening Table. from http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/index.htm
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