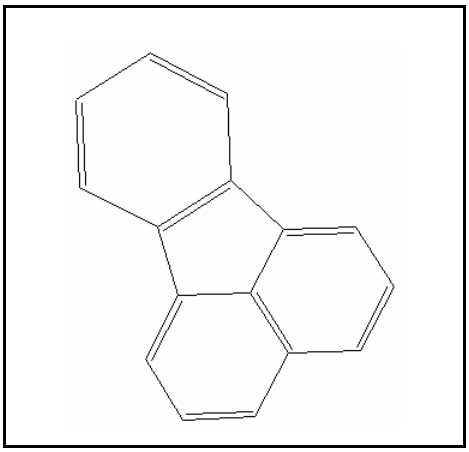
Indiana Department of Environmental Management
Office of Water - Water Quality Standards Section

TIER II HUMAN HEALTH NONCANCER VALUES

FLUORANTHENE



CAS RN:	95-94-3
Water Solubility:	0.265 mg/L
Log K_{ow}:	5.19
Reference Dose:	0.042 mg/kg/day
Carcinogenicity Weight-of-Evidence Classification:	Class D; Not classifiable

Standard

The human health noncancer fluoranthene value for drinking water sources is 9.4 µg/L. The human health noncancer value for nondrinking water sources is 9.5 µg/L.

Calculations

Bioaccumulation Factor:

BAF predicted based on Log K_{ow} (from Stephan 1993)
Log K_{ow} = 5.19 (geometric mean of generator column and slow-stir methods), K_{ow} = 154,882; trophic level 3 FCM = 4.188
Trophic level 4 FCM = 3.873;

$f_{fd} = 1/(1+(0.00000024\ kg/L)(K_{ow})) = 0.964$

Baseline $BAF_{T3} = (FCM)(K_{ow}) = (4.188)(154,882) = 648,646$

Baseline $BAF_{T4} = (3.873)(154,882) = 599,858$

Human health BAF_{T3} = [(648,646)(0.0182)+1](0.964) = 11,381

Human health BAF_{T4} = [(599,858)(0.0310)+1](0.964) = 17,927

Acceptable Daily Exposure:

From the IRIS database:

$$ADE = \frac{NOAEL}{UF} = \frac{125 \text{ mg/kg-day}}{3000} = 0.04167 \text{ mg/kg/d}$$

Calculation of Criteria:

Non Drinking Water HNV = [(0.04167)(70)(0.8)]/0.01+[(0.0036)(11,381)+(0.0114)(17,927)]

= **9.5 μg/L**

Drinking Water HNV = [(0.04167)(70)(0.8)]/2+[(0.0036)(11,381)+(0.0114)(17,927)]

= **9.4 μg/L**

References

1. Stephen, C.E. 1993. Derivation of Proposed Human Health and Wildlife Bioaccumulation Factors for the Great Lakes Initiative. Environmental Research Laboratory, Office of Research and Development, U.S. EPA, Duluth, MN.

2. USEPA 1996. Integrated Risk Information System (IRIS database) chemical file for fluoranthene (206-44-0).

3. Miller, M.M., S.P. Wasik, G.-L. Huang, W.-Y. Shiu, and D. Mackay 1985. Relationships between octanol-water coefficient and aqueous solubility. Environ. Sci. Technol. 19: 522-529. (Reference for the Log K_{ow})

4. de Bruijn, J., F. Busser, W. Seinen, and J. Hemens 1989. Determination of octanol/water partition coefficients for hydrophobic organic chemicals with the "slow-stirring" method. Environ. Toxicol. Chem. 8: 449-512. (Reference for the Log K_{ow} value)

Acronyms/Abbreviations

ADE	Acceptable Daily Exposure
BAF	Bioaccumulation Factor
CAS RN	Chemical Abstract Service Registry Number
FCM	Food Chain Multiplier
IRIS	Integrated Risk Information System
K_{ow}	Octanol-Water Partition Coefficient
LOAEL	Lowest observed adverse effect level
NOAEL	No observed adverse effect level
P (superscript)	Predicted value
UF	Uncertainty factor

Revision History

July 9, 1997 - Values first developed
April 19, 2000 – Fact sheet updated. No modifications to vlaues.

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