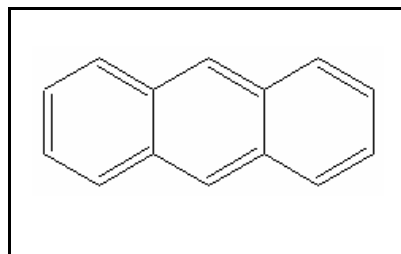




## TIER II HUMAN HEALTH NONCANCER VALUES

### ANTHRACENE

CAS RN: 120-12-7  
Water Solubility: 0.043 mg/L  
Log K<sub>ow</sub>: 4.54  
Reference Dose: 0.33 mg/kg/day  
Carcinogenicity Weight-of-Evidence Classification: Class D; Not classifiable



### Standard

The human health noncancer anthracene value for drinking water sources is 590 µg/L. The human health noncancer value for nondrinking water sources is 630 µg/L.

### Calculations

#### Bioaccumulation Factor:

BAF predicted based on Log K<sub>ow</sub> and measured BCF (from De Voogt 1991, and Stephan 1993)

Log K<sub>ow</sub> = 4.54 (generator-column method), K<sub>ow</sub> = 34,674, BCF = 4,550,

Percent lipid = 9.0; trophic level 3 FCM = 1.766; Trophic level 4 FCM = 1.334

$$f_{fd} = 1/(1+(0.00000024 \text{ kg/L})(K_{ow})) = 0.992$$

$$\text{Baseline BAF}_{T3} = (1.766)[(4550/0.992)-1](1/0.09) = 89,981$$

$$\text{Baseline BAF}_{T4} = (1.334)(4550/0.992)-1](1/0.09) = 67,970$$

$$\text{Human health BAF}_{T3} = [(89,981)(0.0182)+1](0.992) = 1,626$$

$$\text{Human health BAF}_{T4} = [(67,970)(0.0310)+1](0.992) = 2,091$$

#### Acceptable Daily Exposure:

From the IRIS database:

$$\text{ADE} = \frac{\text{NOAEL}}{\text{UF}} = \frac{1000 \text{ mg/kg-day}}{3000} = 0.3333 \text{ mg/kg/d}$$

#### Calculation of Criteria:

$$\begin{aligned} \text{Non Drinking Water HNV} &= [(0.3333)(70)(0.8)]/0.01 + [(0.0036)(1626) + (0.0114)(2091)] \\ &= \mathbf{630 \mu g/L} \end{aligned}$$

$$\begin{aligned} \text{Drinking Water HNV} &= [(0.3333)(70)(0.8)]/2 + [(0.0036)(1626) + (0.0114)(2091)] \\ &= \mathbf{590 \mu g/L} \end{aligned}$$

### **References**

1. De Voogt, P.B., P. Van Haltum, P. Leonards et al. 1991. Bioconcentration of polycyclic heteraromatic hydrocarbons in the guppy (*Poecilia reticulata*). *Aquatic Toxicol.* 20: 169-194.
2. 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.
3. USEPA 1993. Integrated Risk Information System (IRIS database) chemical file for anthracene (120-12-7).
4. 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  $K_{ow}$ )

### **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 <sub>ow</sub> | 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 7, 1997 - Values first developed

March 23, 2000 – Values rechecked (no modifications). Fact sheet updated

## Contact Information

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