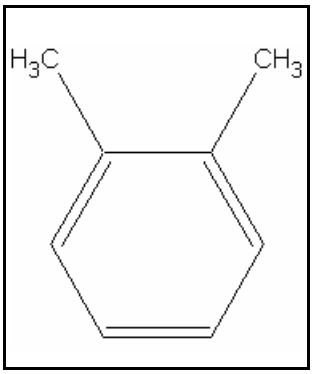
Indiana Department of Environmental Management
Office of Water - Water Quality Standards Section

TIER I HUMAN HEALTH NONCANCER CRITERIA

XYLENE

CAS RN:	1330-20-7
Water Solubility:	0.0175 g/100 mL
Log K_{ow}:	3.17
Reference Dose:	1.79 mg/kg/day
Carcinogenicity Weight-of-Evidence Classification:	Class D; Not Classifiable



Standard

The human health noncancer xylene criterion for drinking water sources is 38,000 µg/L. The human health noncancer criterion for nondrinking water sources is 150,000 µg/L.

Calculations

Bioaccumulation Factor

BAF predicted based on Log K_{ow}

Log K_{ow} = 3.17 (generator-column method), K_{ow} = 1,479
Trophic level 3 FCM = 1.042; trophic level 4 FCM = 1.009

f_{fd} = 1/(1+(0.00000024 kg/L)(K_{ow})) = 1.0

Baseline BAF_{T3} = (FCM)(K_{ow}) = (1.042)(1,479) = 1,541

Baseline BAF_{T4} = (1.009)(1,479) = 1,492

Human health BAF_{T3} = [(1,541)(0.0182)+1](1.0) = 29.05

Human health BAF_{T4} = [(1,492)(0.0310)+1](1.0) = 47.25

Risk Associated Dose:

From the IRIS database:

Critical Effect: Liver and kidney pathology

$$ADE = \frac{NOAEL}{UF} = \frac{179\ mg/kg\text{-}day}{100} = 1.79\ mg/kg/d$$

Calculation of Criteria:

Non Drinking Water HNC = [(1.79)(70)(0.8)]/0.01+[(0.0036)(29.05)+(0.0114)(47.25)]

= **150,000 μg/L**

Drinking Water HNC = [(1.79)(70)(0.8)]/2+[(0.0036)(29.05)+(0.0114)(47.25)]

= **38,000 μg/L**

References

1. USEPA 1987. Integrated Risk Information System (IRIS database) chemical file for xylene (CAS # 1330-20-7).

2. 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

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

August 19, 1997 - Criteria first developed
September 28, 2000 – Criteria rechecked (no modifications). Fact sheet updated.

Contact Information

David B. Kallander
Water Quality Standards Section
Indiana Department of Environmental Management
100 North Senate Ave., P.O. Box 6015
Indianapolis, IN 46206-6015
(317) 233-2472
Email: dkalland@dem.state.in.us