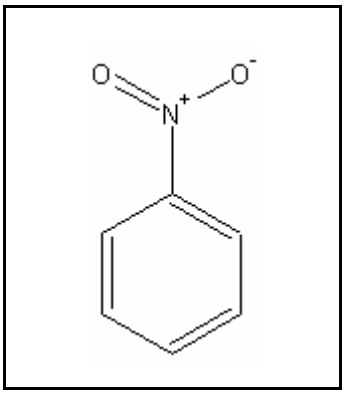
Indiana Department of Environmental Management
Office of Water - Water Quality Standards Section

TIER I HUMAN HEALTH NONCANCER CRITERIA

NITROBENZENE

CAS RN:	98-95-3
Water Solubility:	0.19 g/100 mL
Log K_{ow}:	1.828^{P}
Reference Dose:	0.00046 mg/kg/day
Carcinogenicity Weight-of-Evidence Classification:	Class D; Not Classifiable



Standard

The human health noncancer nitrobenzene criterion for drinking water sources is 13 µg/L. The human health noncancer criterion for nondrinking water sources is 28,000 µg/L.

Calculations

BAF predicted based on Log K_{ow} and measured BCF (from Stephan 1993)
Log K_{ow} = 1.828 (slow stir method), K_{ow} = 67.30, BCF = 0.425, Percent lipid = 1
Trophic level 4 FCM = 1.0; trophic level 3 FCM = 1.0

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

Baseline $BAF_{T3} = (1.0)[(0.425/1.0)-1](1/0.001) = -57.50$

Baseline $BAF_{T4} = (1.0)[(0.425/1.0)-1](1/0.001) = -57.50$

Human health $BAF_{T3} = [(-57.50)(0.0182)+1](1.0) = -0.04649$

Human health BAF_{T4} = [(-57.50)(0.0310)+1](1.0) = -0.7825

Acceptable Daily Exposure:

From the IRIS database:

Critical Effect: Hematologic, adrenal, renal and hepatic lesions

$$ADE = \frac{NOAEL}{UF} = \frac{4.6 \text{ mg/kg-day}}{10{,}000} = 0.00046 \text{ mg/kg/d}$$

Calculation of Criteria:

Non Drinking Water HNC = [(0.00046)(70)(0.8)]/0.01+[(0.0036)(-0.04649)+(0.0114)(-0.7825)]

= **28,000 μg/L**

Drinking Water HNC = [(0.00046)(70)(0.8)]/2+[(0.0036)(-0.04649)+(0.0114)(-0.7825)]

= **13 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 1991. Integrated Risk Information System (IRIS database) chemical file for nitrobenzene (98-95-3).

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
RPLC	Reverse-phase Liquid Chromatography
UF	Uncertainty factor

Revision History

July 15, 1999 - Criteria first developed
July 26, 2000 – Fact sheet updated. No modifications to criteria.

Contact Information

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