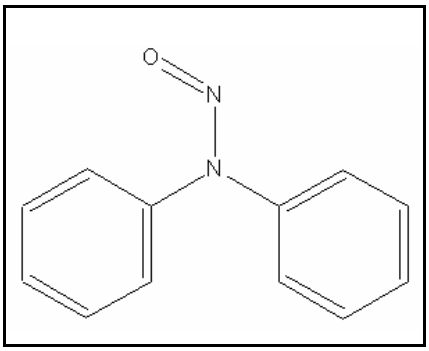
Indiana Department of Environmental Management
Office of Water – Water Quality Standards Section

TIER I HUMAN HEALTH CANCER CRITERIA

N-NITROSODIPHENYLAMINE

CAS RN:	86-30-6
Water Solubility:	0.0035 g/100 mL
Log K_{ow}:	3.16^{P}
Risk Associated Dose:	2.04×10^{-3} mg/kg/day
Carcinogenicity Weight-of-Evidence Classification:	Class B2; Probable human Carcinogen



Standard

The human health cancer n-nitrosodiphenylamine criterion for drinking water sources is 36 µg/L. The human health cancer criterion for nondrinking water sources is 74 µg/L.

Calculations

Bioaccumulation Factor:

BAF predicted based on Log K_{ow} and measured BCF (from Stephan 1993)
Log K_{ow} = 3.16 (CLOGP method), K_{ow} = 1445, BCF = 217, Percent lipid = 4.8
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 $BAF_{T3} = (1.042)[(217/1.0)-1](1/0.048) = 4689$

Baseline $BAF_{T4} = (1.009)[(217/1.0)-1](1/0.048) = 4540$

Human health BAF_{T3} = [(4689)(0.0182)+1](1.0) = 86.33

Human health BAF_{T4} = [(4540)(0.0310)+1](1.0) = 141.74

Risk Associated Dose:

$RAD = 0.00001/q1^{*} = 0.00001/ 4.9 \times 10^{-3}$
$= 2.0408 \times 10^{-3}$ mg/kg/day

Where:

RAD = Risk Associated Dose (mg/kg/day)
$q1^{*}$ = Cancer Slope Factor

Calculation of Criteria:

Non Drinking Water HCC = $[(2.0408 \times 10^{-3})(70)]/0.01+[(0.0036)(86.33)+(0.0114)(141.74)]$

= 74 μg/L

Drinking Water HCC = $[(2.0408 \times 10^{-3})(70)]/2+[(0.0036)(86.33)+(0.0114)(141.74)]$

= 36 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 1993. Integrated Risk Information System (IRIS database) chemical file for n-nitrosodiphenylamine (86-30-6).

3. Leo,A. and D.Weininger 1997. Daylight Software CLogP Version 3.15+ for Unix Pomona Medical Chemistry Project, Pomona College, Claremont, CA. Distributed by Daylight Chemical Information Systems, Inc., 3952 Claremont St., Irving, CA 92714 (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

July 10, 1997 Criteria first developed
August 24, 2000 Fact sheet updated. No modifications to criteria.

Contact Information

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