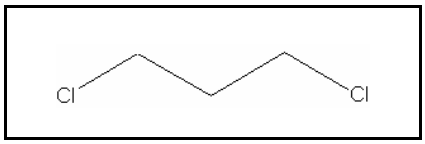
Indiana Department of Environmental Management
Office of Water - Water Quality Standards Section

TIER I HUMAN HEALTH CANCER CRITERIA

1,3-DICHLOROPROPENE



CAS RN:	542-75-6
Water Solubility:	4,500 mg/L
Log K_{ow}:	1.60^{P}
Risk Associated Dose:	0.0001 mg/kg/day
Carcinogenicity Weight-of-Evidence Classification:	Class B2; Probable human carcinogen

Standard

The human health cancer 1,3-dichloropropene criterion for drinking water sources is 3.4 µg/L.
The human health cancer criterion for nondrinking water sources is 170 µg/L.

Calculations

Bioaccumulation Factor:

BAF predicted based on Log K_{ow}
Log K_{ow} = 1.60 (CLOGP program), K_{ow} = 39.81
Trophic level 3 FCM = 1.0; trophic level 4 FCM = 1.0

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

Baseline $BAF_{T3} = (FCM)(K_{ow}) = (39.81)(1.0) = 39.81$

Baseline $BAF_{T4} = (39.81)(1.0) = 39.81$

Human health BAF_{T3} = [(32.66)(0.0182)+1](1.0) = 1.725

Human health BAF_{T4} = [(32.66)(0.0310)+1](1.0) = 2.234

Risk Associated Dose:

From the IRIS database:

$RAD = 0.00001/q1^{*} = 0.00001/0.1$
$= 0.0001$

Where:

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

Calculation of Criteria:

NonDrinking Water HCC = [(0.0001)(70)]/0.01+[(0.0036)(1.725)+(0.0114)(2.234)]

= **170 μg/L**

Drinking Water HCC = [(0.0001)(70)]/2+[(0.0036)(1.725)+(0.0114)(2.234)]

= **3.4 μg/L**

References

1. USEPA 2000. Integrated Risk Information System (IRIS database) chemical file for 1,3-dichloropropene (CAS # 542-75-6).

2. 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
RPLC	Reverse-phase Liquid Chromatography
UF	Uncertainty factor

Revision History

September 12, 2000 - Criteria first developed

Contact Information

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