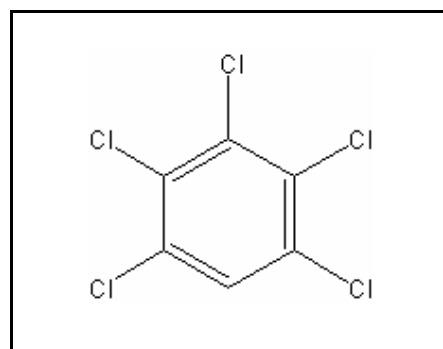




TIER I HUMAN HEALTH NONCANCER CRITERIA

PENTACHLOROBENZENE

CAS RN: 608-93-5
Water Solubility: 0.000024 g/100 mL
Log K_{ow} : 5.106
Reference Dose: 8.3×10^{-4} mg/kg/day
Carcinogenicity Weight-of-Evidence Classification: Class D; not classifiable



Standard

The human health noncancer, endosulfan criterion for drinking water sources is 0.18 $\mu\text{g/L}$. The human health noncancer criterion for nondrinking water sources is 0.18 $\mu\text{g/L}$.

Calculations

BAF - field measured (from EPA 1995)

Log K_{ow} = 5.106, K_{ow} = 127,643

BAF = 645,700; Trophic level 3 FCM = 3.643

Trophic level 4 FCM = 3.162;

$$f_{fd} = 1/(1+(0.00000024 \text{ kg/L})(K_{ow})) = 0.9661$$

$$\text{Baseline BAF}_{T3} = 467,700$$

$$\text{Baseline BAF}_{T4} = 645,700$$

$$\text{Human health BAF}_{T3} = 8,248$$

Human health BAF_{T4} = 19,420

Acceptable Daily Exposure:

From the IRIS database:

Critical Effect: Liver and kidney toxicity

$$ADE = \frac{NOAEL}{UF} = \frac{8.3 \text{ mg/kg-day}}{10,000} = 0.00083 \text{ mg/kg/d}$$

Calculation of Criteria:

$$\begin{aligned} \text{Non Drinking Water HNC} &= [(0.00083)(70)(0.8)]/0.01 + [(0.0036)(8,248) + (0.0114)(19,420)] \\ &= 0.18 \text{ } \mu\text{g/L} \end{aligned}$$

$$\begin{aligned} \text{Drinking Water HNC} &= [(0.00083)(70)(0.8)]/2 + [(0.0036)(8,248) + (2.698)(19,420)] \\ &= 0.18 \text{ } \mu\text{g/L} \end{aligned}$$

References

1. USEPA 1988. Integrated Risk Information System (IRIS database) chemical file endosulfan (608-93-5).
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})
3. USEPA 1995. Great Lakes Water Quality Initiative Technical Support Document for the Procedure to Determine Bioaccumulation Factors. EPA-820-B-95-005.

Acronyms/Abbreviations

ADE	Acceptable Daily Exposure
BAF	Bioaccumulation Factor
CAS RN	Chemical Abstract Service

	Registry Number
FCM	Food Chain Multiplier
HCC	Human Cancer Criterion
HNC	Human Noncancer Criterion
HCV	Human Cancer Value
HNW	Human Noncancer Value
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

December 8, 1999 - Criteria first developed

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