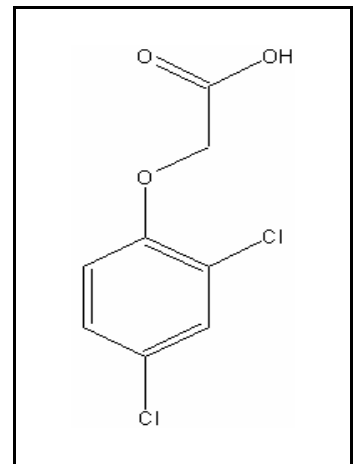




TIER I HUMAN HEALTH NONCANCER CRITERIA

2,4-D

| | |
|--|---------------------------|
| CAS RN: | 94-75-7 |
| Water Solubility: | 3.4 mg/L |
| Log K_{ow} : | 2.80 ^P |
| Reference Dose: | 0.01 mg/kg/day |
| Carcinogenicity Weight-of-Evidence Classification: | Class D; Not Classifiable |



Standard

The human health noncancer 2,4-dichlorophenoxyacetic acid (2,4-d) criterion for drinking water sources is 250 $\mu\text{g/L}$. The human health noncancer criterion for nondrinking water sources is 2,000 $\mu\text{g/L}$.

Calculations

Bioaccumulation Factor:

BAF predicted based on Log K_{ow}

$$\text{Log } K_{ow} = 2.80 \text{ (CLOGP program), } K_{ow} = 631.0$$

$$\text{Trophic level 3 FCM} = 1.028; \text{ trophic level 4 FCM} = 1.007$$

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

$$\text{Baseline BAF}_{T3} = (\text{FCM})(K_{ow}) = (1.028)(631.0) = 648.6$$

$$\text{Baseline BAF}_{T4} = (1.007)(631.0) = 635.4$$

$$\text{Human health BAF}_{T3} = [(648.6)(0.0182)+1](1.0) = 12.80$$

$$\text{Human health BAF}_{T4} = [(635.4)(0.0310)+1](1.0) = 20.69$$

Acceptable Daily Exposure:

From the IRIS database:

Critical Effect: Hematologic, hepatic and renal toxicity

$$\text{ADE} = \frac{\text{NOAEL}}{\text{UF}} = \frac{1 \text{ mg/kg-day}}{100} = 0.01 \text{ mg/kg/d}$$

Calculation of Criteria:

$$\begin{aligned} \text{Non Drinking Water HNC} &= [(0.01)(70)(0.8)]/0.01+[(0.0036)(12.80)+(0.0114)(20.69)] \\ &= \mathbf{2,000 \mu\text{g/L}} \end{aligned}$$

$$\begin{aligned} \text{Drinking Water HNC} &= [(0.01)(70)(0.8)]/2+[(0.0036)(12.80)+(0.0114)(20.69)] \\ &= \mathbf{250 \mu\text{g/L}} \end{aligned}$$

References

1. USEPA 1999. Integrated Risk Information System (IRIS database) chemical file for 2,4-dichlorophenoxyacetic acid (CAS # 94-75-7).
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

February 24, 1999 - Criteria first developed

April 12, 2000 – Fact sheet updated. No modifications made to criteria.

Contact Information

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