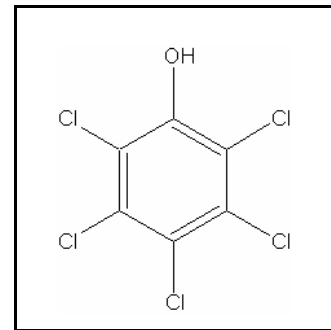




TIER I HUMAN HEALTH NONCANCER CRITERIA

PENTACHLOROPHENOL

CAS RN:	87-86-5
Water Solubility:	0.0014 g/100 mL
Log K_{ow} :	5.01
Reference Dose:	0.03 mg/kg/day
Carcinogenicity Weight-of-Evidence Classification:	Class B2; Probable human carcinogen



Standard

The human health noncancer pentachlorophenol criterion for drinking water sources is 820 $\mu\text{g/L}$.
The human health noncancer criterion for nondrinking water sources is 24,000 $\mu\text{g/L}$.

Calculations

Bioaccumulation Factor:

BAF predicted based on Log K_{ow} and measured BCF (from Stephan 1993)

Log K_{ow} = 5.01 (RPLC), K_{ow} = 102,329, BCF = 40.63, Percent lipid = 1

Trophic level 3 FCM = 3.181; trophic level 4 FCM = 2.612

$$f_{fd} = 1/(1+(0.00000024 \text{ kg/L})(K_{ow})) = 0.9760$$

$$\text{Baseline BAF}_{T3} = (3.181)[(40.63/0.9760)-1](1/0.01) = 129.2$$

$$\text{Baseline BAF}_{T4} = (2.612)[(40.63/0.9760)-1](1/0.01) = 106.1$$

$$\text{Human health BAF}_{T3} = [(129.2)(0.0182)+1](0.9760) = 3.272$$

$$\text{Human health BAF}_{T4} = [(106.1)(0.0310)+1](0.9760) = 4.187$$

Acceptable Daily Exposure:

From the IRIS database:

Critical Effect: liver and kidney pathology

$$\text{ADE} = \frac{\text{NOAEL}}{\text{UF}} = \frac{3 \text{ mg/kg-day}}{100} = 0.03 \text{ mg/kg/d}$$

Calculation of Criteria:

$$\begin{aligned} \text{Non Drinking Water HNC} &= [(0.03)(70)(0.8)]/0.01+[(0.0036)(3.272)+(0.0114)(4.187)] \\ &= \mathbf{24,000 \mu\text{g/L}} \end{aligned}$$

$$\begin{aligned} \text{Drinking Water HNC} &= [(0.03)(70)(0.8)]/2+[(0.0036)(3.272)+(0.0114)(4.187)] \\ &= \mathbf{820 \mu\text{g/L}} \end{aligned}$$

References

1. USEPA 1993. Integrated Risk Information System (IRIS database) chemical file for pentachlorophenol (87-86-5).

Acronyms/Abbreviations

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

September 14, 2000 - Criteria first developed.

Contact Information

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