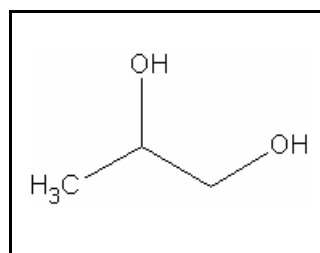




TIER I HUMAN HEALTH NONCANCER CRITERIA

PROPYLENE GLYCOL

CAS RN:	57-55-6
Water Solubility:	≥ 10 g/100 mL at 21 C
Log K_{ow} :	-1.060 ^P
Reference Dose:	25 mg/kg/d
Carcinogenicity Weight-of-Evidence Classification:	Class D; not classifiable



Standard

The human health noncancer propylene glycol criterion for drinking water sources is 700,000 $\mu\text{g/L}$. The human health noncancer criterion for nondrinking water sources is 56,000,000 $\mu\text{g/L}$.

Calculations

Bioaccumulation Factor:

BAF predicted based on Log K_{ow}

$$\text{Log } K_{ow} = -1.060 \text{ (CLOGP program), } K_{ow} = 0.0871$$

$$\text{Trophic level 3 FCM} = 1.000; \text{ trophic level 4 FCM} = 1.000$$

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

$$\text{Baseline BAF}_{T3} = (\text{FCM})(K_{ow}) = (1.0)(.0871) = 0.0871$$

$$\text{Baseline BAF}_{T4} = (1.0)(0.0871) = 0.0871$$

$$\text{Human health BAF}_{T3} = [(0.0871)(0.0182)+1](1.0) = 1.002$$

$$\text{Human health BAF}_{T4} = [(0.0871)(0.0310)+1](1.0) = 1.002$$

Acceptable Daily Exposure:

From Gaunt et al. (1972):

$$\text{ADE} = \frac{\text{NOAEL}}{\text{UF}} = \frac{2500 \text{ mg/kg-day}}{100} = 25 \text{ mg/kg/d}$$

Where: Uncertainty factor = 100

10x for interspecies extrapolation

10x for differences in individual human sensitivity

Calculation of Criteria:

$$\begin{aligned} \text{Non Drinking Water HNC} &= [(25)(70)(0.8)]/0.01+[(0.0036)(1.002)+(0.0114)(1.002)] \\ &= \mathbf{56,000,000 \text{ } \mu\text{g/L}} \end{aligned}$$

$$\begin{aligned} \text{Drinking Water HNC} &= [(25)(70)(0.8)]/2+[(0.0036)(1.002)+(0.0114)(1.002)] \\ &= \mathbf{700,000 \text{ } \mu\text{g/L}} \end{aligned}$$

References

1. Gaunt, IF, Carpanin FMB, Grasso, P. 1972. Long-term toxicity of propylene glycol in rats. Food Cosmet Toxicol 10(2): 151-162.
2. USEPA 1998. Integrated Risk Information System (IRIS database) chemical file for propylene glycol (CAS # 57-55-6).
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/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

December 11, 1998 - Criteria first developed.

September 15, 2000 – Fact sheet updated. No new data available.

Contact Information

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