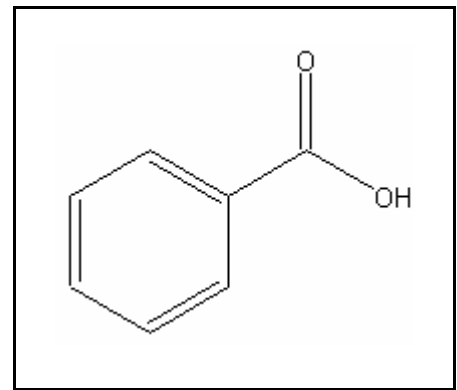




TIER I HUMAN HEALTH NONCANCER CRITERIA

BENZOIC ACID

CAS RN:	65-85-0
Water Solubility:	3,400 mg/L
Log K_{ow} :	1.88 ^P
Reference Dose:	4 mg/kg/day
Carcinogenicity Weight-of-Evidence Classification:	Class D; Not Classifiable



Standard

The human health noncancer benzoic acid criterion for drinking water sources is 109,000 $\mu\text{g/L}$.
The human health noncancer criterion for nondrinking water sources is 3,900,000 $\mu\text{g/L}$.

Calculations

Bioaccumulation Factor:

BAF predicted based on Log K_{ow}

Log K_{ow} = 1.88 (CLOGP program), K_{ow} = 75.86

Trophic level 3 FCM = 1.005; trophic level 4 FCM = 1.0

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

$$\text{Baseline BAF}_{T3} = (\text{FCM})(K_{ow}) = (75.86)(1.0) = 75.86$$

$$\text{Baseline BAF}_{T4} = (75.86)(1.0) = 75.86$$

$$\text{Human health BAF}_{T3} = [(75.86)(0.0182)+1](1.0) = 76.24$$

$$\text{Human health BAF}_{T4} = [(75.86)(0.0310)+1](1.0) = 75.86$$

Acceptable Daily Exposure:

From the IRIS database:

$$\text{ADE} = \frac{\text{LOAEL}}{\text{UF}} = \frac{4 \text{ mg/kg-day}}{1} = 4 \text{ mg/kg/d}$$

Calculation of Criteria:

$$\begin{aligned} \text{Non Drinking Water HNC} &= [(4)(70)(0.8)]/0.01+[(0.0036)(75.86)+(0.0114)(1.065)] \\ &= \mathbf{110,000 \mu\text{g/L}} \end{aligned}$$

$$\begin{aligned} \text{Drinking Water HNC} &= [(4)(70)(0.8)]/2+[(0.0036)(75.86)+(0.0114)(1.065)] \\ &= \mathbf{3,900,000 \mu\text{g/L}} \end{aligned}$$

References

1. USEPA 1993. Integrated Risk Information System (IRIS database) chemical file for benzoic acid (CAS # 65-85-0).
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

April 15, 1998 - Criteria first developed

March 28, 2000 – Criteria rechecked (no modifications). Fact sheet updated.

Contact Information

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