



TIER I HUMAN HEALTH NONCANCER CRITERIA

ZINC

CAS RN: 7440-66-6
Water Solubility:
Log K_{ow} :
Reference Dose: 0.3333 mg/kg/day
Carcinogenicity Weight-of-
Evidence Classification: Class D; Not Classifiable

Standard

The human health noncancer zinc criterion for drinking water sources is 9,000 $\mu\text{g/L}$. The human health noncancer criterion for nondrinking water sources is 250,000 $\mu\text{g/L}$.

Calculations

Bioaccumulation Factor

BAF for inorganics is equal to the BCF (from Stephan 1993)

$$\text{BAF} = 4.4; \text{FCM} = 1.0$$

$$\text{Human health BAF}_{T3} = 4.4$$

$$\text{Human health BAF}_{T4} = 4.4$$

Risk Associated Dose:

From the IRIS database:

$$\text{ADE} = \frac{\text{LOAEL}}{\text{UF}} = \frac{1 \text{ mg/kg-day}}{3} = 0.3333 \text{ mg/kg/d}$$

Calculation of Criteria:

$$\begin{aligned} \text{Non Drinking Water HNC} &= [(0.3333)(70)(0.8)]/0.01 + [(0.0036)(4.4) + (0.0114)(4.4)] \\ &= \mathbf{250,000 \text{ } \mu\text{g/L}} \end{aligned}$$

$$\begin{aligned} \text{Drinking Water HNC} &= [(0.3333)(70)(0.8)]/2 + [(0.0036)(4.4) + (0.0114)(4.4)] \\ &= \mathbf{9,000 \text{ } \mu\text{g/L}} \end{aligned}$$

References

1. Stephen, C.E. 1993. Derivation of Proposed Human Health and Wildlife Bioaccumulation Factors for the Great Lakes Initiative. Environmental Research Laboratory, Office of Research and Development, U.S. EPA, Duluth, MN.
2. USEPA 1992. Integrated Risk Information System (IRIS database) chemical file for zinc (7440-66-6).

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
UF	Uncertainty factor

Revision History

August 19, 1997 - Criteria first developed

September 29, 2000 – Criteria rechecked (no modifications). Fact sheet updated.

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