



TIER I HUMAN HEALTH NONCANCER CRITERIA

SELENIUM

CAS RN: 7782-49-2
Water Solubility:
Log K_{ow} :
Reference Dose: 0.005 mg/kg/day
Carcinogenicity Weight-of-
Evidence Classification: Class D; not classifiable

Standard

The human health noncancer selenium criterion for drinking water sources is 140 $\mu\text{g/L}$. The human health noncancer criterion for nondrinking water sources is 3,400 $\mu\text{g/L}$.

Calculations

Bioaccumulation Factor:

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

$$\text{BCF} = 4.9; \text{FCM} = 1.0$$

$$\text{Human health BAF}_{T3} = 4.9$$

$$\text{Human health BAF}_{T4} = 4.9$$

Acceptable Daily Exposure:

From the IRIS database:

$$\text{ADE} = \frac{\text{NOAEL}}{\text{UF}} = \frac{0.015 \text{ mg/kg-day}}{3} = 0.005 \text{ mg/kg/d}$$

Calculation of Criteria:

$$\begin{aligned} \text{Non Drinking Water HNC} &= [(0.005)(70)(0.8)]/0.01 + [(0.0036)(4.9) + (0.0114)(4.9)] \\ &= \mathbf{3,400 \text{ } \mu\text{g/L}} \end{aligned}$$

$$\begin{aligned} \text{Drinking Water HNC} &= [(0.005)(70)(0.8)]/2 + [(0.0036)(4.9) + (0.0114)(4.9)] \\ &= \mathbf{140 \text{ } \mu\text{g/L}} \end{aligned}$$

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 1991. Integrated Risk Information System (IRIS database) chemical file for selenium (7782-49-2).

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

August 19, 1997 - Criteria first developed.

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

Contact Information

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