



TIER I HUMAN HEALTH NONCANCER CRITERIA

VANADIUM

CAS RN: 7440-62-2
Water Solubility:
Log K_{ow} :
Reference Dose: 0.0089 mg/kg/day
Carcinogenicity Weight-of-
Evidence Classification: None

Standard

The human health noncancer vanadium criterion for drinking water sources is 230 $\mu\text{g/L}$. The human health noncancer criterion for nondrinking water sources is 2,300 $\mu\text{g/L}$.

Calculations

Bioaccumulation Factor:

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

$$\text{BCF} = 13.7; \text{FCM} = 1.0$$

$$\text{Human health BAF}_{T3} = 13.7$$

$$\text{Human health BAF}_{T4} = 13.7$$

Acceptable Daily Exposure:

From the IRIS database:

$$\text{ADE} = \frac{\text{NOAEL}}{\text{UF}} = \frac{0.89 \text{ mg/kg-day}}{100} = 0.0089 \text{ mg/kg/d}$$

Calculation of Criteria:

$$\begin{aligned} \text{Non Drinking Water HNC} &= [(0.0089)(70)(0.8)]/0.01 + [(0.0036)(13.7) + (0.0114)(13.7)] \\ &= \mathbf{2,300 \text{ } \mu\text{g/L}} \end{aligned}$$

$$\begin{aligned} \text{Drinking Water HNC} &= [(0.0089)(70)(0.8)]/2 + [(0.0036)(13.7) + (0.0114)(13.7)] \\ &= \mathbf{230 \text{ } \mu\text{g/L}} \end{aligned}$$

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. Holdway, D.A. 1983. Bioconcentration of vanadium in American Flagfish over one reproductive cycle. Wat. Res. 17: 937-941.
3. USEPA 1996. Integrated Risk Information System (IRIS database) chemical file 1,2,4,5-vanadium (7440-62-2).

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

March 18, 1999 - Criteria first developed

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

Contact Information

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