



TIER I HUMAN HEALTH NONCANCER CRITERIA

ARSENIC

CAS RN: 7440-38-2
Water Solubility:
Log K_{ow} :
Reference Dose: 0.00027 mg/kg/day
Carcinogenicity Weight-of-
Evidence Classification: Class D; Not Classifiable

Standard

The human health noncancer arsenic criterion for drinking water sources is 10 $\mu\text{g/L}$. The human health noncancer criterion for nondrinking water sources is 230 $\mu\text{g/L}$.

Calculations

BAF for inorganics is equal to the BCF
 $\text{BCF} = 3.6$; $\text{FCM} = 1.0$

Human health $\text{BAF}_{T3} = 3.6$

Human health $\text{BAF}_{T4} = 3.6$

Acceptable Daily Exposure:

From the IRIS database:

Critical Effect: Hyperpigmentation, keratosis and possible vascular complications

$$\text{ADE} = \frac{\text{NOAEL}}{\text{UF}} = \frac{0.0008 \text{ mg/kg-day}}{3} = 0.0002667 \text{ mg/kg/d}$$

Calculation of Criteria:

$$\begin{aligned} \text{Non Drinking Water HNC} &= [(0.0002667)(70)(0.8)]/0.01+[(0.0036)(3.6)+(0.0114)(3.6)] \\ &= \mathbf{230 \mu\text{g/L}} \end{aligned}$$

$$\begin{aligned} \text{Drinking Water HNC} &= [(0.0002667)(70)(0.8)]/2+[(0.0036)(3.6)+(0.0114)(3.6)] \\ &= \mathbf{10 \mu\text{g/L}} \end{aligned}$$

References

1. USEPA 1993. Integrated Risk Information System (IRIS database) chemical file arsenic (7440-38-2).

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

March 30, 1999 - Criteria first developed

March 23, 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