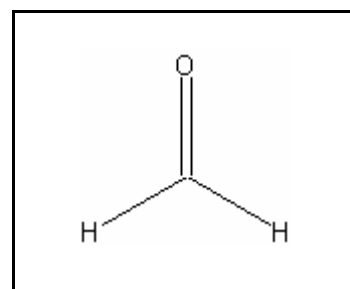




## TIER I HUMAN HEALTH NONCANCER CRITERIA

### FORMALDEHYDE

CAS RN:	50-00-0
Water Solubility:	55 g/100 mL
Log $K_{ow}$ :	4.645 <sup>P</sup>
Reference Dose:	0.007 mg/kg/day
Carcinogenicity Weight-of-Evidence Classification:	Class B1; Probable human carcinogen



### Standard

The human health noncancer formaldehyde criterion for drinking water sources is 3,200  $\mu\text{g/L}$ .  
The human health noncancer criterion for nondrinking water sources is 320,000  $\mu\text{g/L}$ .

### Calculations

#### Bioaccumulation Factor:

BAF predicted based on Log  $K_{ow}$

$$\text{Log } K_{ow} = 0.35 \text{ (CLOGP)}, K_{ow} = 2.2387$$

$$\text{Trophic level 3 FCM} = 1.0; \text{ trophic level 4 FCM} = 1.0$$

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

$$\text{Baseline BAF}_{T3} = (\text{FCM})(K_{ow}) = (1.0)(2.2387) = 2.2387$$

$$\text{Baseline BAF}_{T4} = (1.0)(2.2387) = 2.2387$$

$$\text{Human health BAF}_{T3} = [(2.2387)(0.0182)+1](1.0) = 1.04$$

$$\text{Human health BAF}_{T4} = [(2.2387)(0.0310)+1](1.0) = 1.07$$

### Acceptable Daily Exposure:

From the IRIS database:

Critical Effect: decreased growth rate, food consumption, and organ weights

$$\text{ADE} = \frac{\text{NOAEL}}{\text{UF}} = \frac{15 \text{ mg/kg-day}}{100} = 0.15 \text{ mg/kg/d}$$

### Calculation of Criteria:

$$\begin{aligned} \text{Non Drinking Water HNC} &= [(0.15)(70)(0.8)]/0.01+[(0.0036)(1.04)+(0.0114)(1.07)] \\ &= \mathbf{4,200 \mu\text{g/L}} \end{aligned}$$

$$\begin{aligned} \text{Drinking Water HNC} &= [(0.15)(70)(0.8)]/2+[(0.0036)(1.04)+(0.0114)(1.07)] \\ &= \mathbf{320,000 \mu\text{g/L}} \end{aligned}$$

## References

1. 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  $K_{ow}$ )
2. USEPA 1990. Integrated Risk Information System (IRIS database) chemical file for formaldehyde (CAS # 50-00-0).

## Acronyms

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ADE	Acceptable Daily Exposure
BAF	Bioaccumulation Factor
CAS RN	Chemical Abstract Service Registry Number
FCM	Food Chain Multiplier
IRIS	Integrated Risk Information System
K <sub>ow</sub>	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 23, 1999 - Criteria first developed

April 20, 2000 – Fact sheet updated. No modifications to criteria.

## Contact Information

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