

The National Institute for Occupational Safety and Health (NIOSH)



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## Arsenic (inorganic compounds, as As)

IMMEDIATELY DANGEROUS TO LIFE OR HEALTH CONCENTRATIONS (IDLH)

MAY 1994

CAS number 7440-38-2 (Metal)

NIOSH REL 0.002 mg As/m<sup>3</sup> 15-minute CEILING; NIOSH considers inorganic arsenic compounds to be potential occupational carcinogens as defined by the OSHA carcinogen policy [29 CFR 1990].

Current OSHA PEL: 0.010 mg As/m<sup>3</sup> TWA

1989 OSHA PEL: Same as current PEL

1993-1994 ACGIH TLV: 0.01 mg As/m<sup>3</sup> TWA, A1

Description of substance: Varies

Original (SCP) IDLH: 100 mg As/m<sup>3</sup>

Basis for original (SCP) IDLH: The chosen IDLH is based on the cat 1-hour LCLO of 100 mg/m<sup>3</sup> for arsenic trichloride [Flury 1921 cited by NIOSH 1976].

Short-term exposure guidelines: None developed

### ACUTE TOXICITY DATA

#### Lethal concentration data:

Species	Reference	LC50	LCLo	0.5-hr Time	Adjusted LC (CF)	Derived Value
AsCl <sub>3</sub>						
Cat	Flury 1921	-----	100 mg/m <sup>3</sup>	1 hr	52 mg As/m <sup>3</sup> (1.25)	5.2 mg As/m <sup>3</sup>
Cat	Spector 1955	-----	200 mg/m <sup>3</sup>	20 min	79 mg As/m <sup>3</sup> (0.96)	7.9 mg As/m <sup>3</sup>
Mouse	Spector 1955	-----	338 ppm	10 min	726 mg As/m <sup>3</sup> (0.69) 73	mg As/m <sup>3</sup>

#### Lethal dose data:

Species	Reference	Route	LD50(mg/kg)	LDLo(mg/kg)	Adjusted LD	Derived Value
Rat	Davydova et al. 1987	oral	763	-----	5,341 mg As/m <sup>3</sup>	534 mg As/m <sup>3</sup>
Mouse	Davydova et al. 1987	oral	145	-----	1,015 mg As/m <sup>3</sup>	102 mg As/m <sup>3</sup>
Ca <sup>3</sup> (AsO <sub>4</sub> ) <sub>2</sub>						
Rat	Lehman 1951	oral	20	-----	53 mg As/m <sup>3</sup>	5.3 mg As/m <sup>3</sup>
Mouse	MacEwen and Vernot 1972	oral	794	-----	2,090 mg As/m <sup>3</sup>	209 mg As/m <sup>3</sup>
Rabbit	Muehlberger 1930	oral	50	-----	132 mg As/m <sup>3</sup>	13 mg As/m <sup>3</sup>
Dog	Perkow 1971/1976	oral	38	-----	100 mg As/m <sup>3</sup>	10 mg As/m <sup>3</sup>
Pb <sup>3</sup> (AsO <sub>4</sub> ) <sub>2</sub>						
Rabbit	Muehlberger 1930	oral	75	-----	88 mg As/m <sup>3</sup>	8.8 mg As/m <sup>3</sup>

**Human data:** None relevant for use in determining the revised IDLH.

**Revised IDLH:** 5 mg As/m<sup>3</sup>

**Basis for revised IDLH:** The revised IDLH for inorganic arsenic compounds is 5 mg As/m<sup>3</sup> based on acute inhalation toxicity data in animals [Flury 1921; Spector 1955]. This may be a conservative value due to the lack of relevant acute toxicity data for workers. [Note: NIOSH recommends as part of its carcinogen policy that the "most protective" respirators be worn for inorganic arsenic compounds at concentrations above 0.002 mg As/m<sup>3</sup>. OSHA currently requires in 29 CFR 1919.1018 that workers be provided with and required to wear and use the "most protective" respirators in concentrations exceeding 20 mg As/m<sup>3</sup> (i.e., 2,000 x the PEL).]

#### REFERENCES:

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4. MacEwen JD, Vernot EH [1972]. Toxic Hazards Research Unit annual technical report: 1972. Wright-Patterson Air Force Base, OH: Aerospace Medical Research Laboratory, Report AMRL-TR-72-62.
5. Muehlberger CW [1930]. Toxicity studies of fluorine insecticides. *J Pharmacol Exp Ther* 39:246-248.
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7. Perkow W [1971/1976]. *Wirksubstanzen der Pflanzenschutz und Schadlingsbekämpfungsmittel.* Berlin, Germany: Verlag Paul Parey (in German).
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Page last reviewed: December 4, 2014