

Uranium (soluble compounds, as U)

IDLH Documentation

CAS number: Varies

NIOSH REL: 0.05 mg/m³ TWA; NIOSH considers soluble uranium compounds to be potential occupational carcinogens as defined by the OSHA carcinogen policy [29 CFR 1990].

Current OSHA PEL: 0.05 mg/m³ TWA

1989 OSHA PEL: Same as current PEL

1993-1994 ACGIH TLV: 0.2 mg/m³ TWA, 0.6 mg/m³ STEL

Description of substance: Varies

Original (SCP) IDLH: 20 mg U/m³

Basis for original (SCP) IDLH: The chosen IDLH is based on the statement by Patty [1963] that UO₂(NO₃)₂·6H₂O of respirable particle size and dusts and mists of UF₆, UO₂F₂, and UCl₄ were generally fatal to most laboratory species when exposed daily for 1 month at 20 mg/m³ [Wilson et al. 1953]. No useful data on acute inhalation toxicity are available on which to base the IDLH.

Short-term exposure guidelines: None developed

ACUTE TOXICITY DATA:

Lethal dose data:

Species	Reference	Route	LD ₅₀ (mg/kg)	LD _{Lo} (mg/kg)	Adjusted LD	Derived value
UO ₂ (NO ₃) ₂ ·6H ₂ O Dog	Spector 1956	oral	-----	12	84 mg/m ³	8.4 mg/m ³
UO ₂ (NO ₃) ₂ ·6H ₂ O Cat	Spector 1956	oral	-----	238	1,666 mg/m ³	167 mg/m ³

Other animal data: No grossly observable signs or symptoms were induced in mice, rats, guinea pigs, rabbits, or dogs following the first day of exposure to 20 mg/m³ of UF₆ (13.5 mg U/m³), UO₂F₂ (15.5 mg U/m³), UCl₄ (12.5 mg U/m³), or UO₂(NO₃)₂·H₂O (9.5 mg U/m³) [Wilson et al. 1953].

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

Revised IDLH: 10 mg U/m³

Basis for revised IDLH: The revised IDLH for soluble uranium compounds is 10 mg U/m³ based on chronic toxicity data in animals [Wilson et al. 1953]. [Note: NIOSH recommends as part of its carcinogen policy that the "most protective" respirators be worn for soluble uranium compounds at concentrations above 0.05 mg U/m³.]

REFERENCES:

1. Patty FA, ed. [1963]. Industrial hygiene and toxicology. 2nd rev. ed. Vol. II. Toxicology. New York, NY: Interscience Publishers, Inc., p. 1167.
2. Spector WS, ed. [1956]. Handbook of toxicology. Vol. I. Acute toxicities. Philadelphia, PA: W.B. Saunders Company, p. 310.
3. Wilson HB, Stokinger HE, Sylvester GE [1953]. Acute toxicity of carnotite ore dust. AMA Arch Ind Hyg Occup Med 7:301-309.

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