

CLIP, Chemical Laboratory Information Profile

"Only when you know the hazards, can you take the necessary precautionary measures."

Osmium Tetroxide**CAS No.: 20816-12-0**

Synonyms: Osmium(VIII) oxide, Osmic acid anhydride, osmium oxide

Physical Properties**Exposure Limits**

Two allotropes, white and pale yellow solids with acrid, irritating odor; both forms sublime readily.
 Vapor pressure at 20 °C: approx. 5 torr, both allotropes
 Melting point: 39.5 and 41 °C
 Boiling point: 130 °C

OSHA PEL: 0.002 mg/m³
 ACGIH TLV: 0.0002 mg/m³

Hazardous Characteristics

Overall toxicity	Flammability	Destructive to skin/eye	Absorbed through skin	Sensitizer?	Self-reactive?	Incompatible with:
3	0	4	No	No	No	Any substance that can burn, all reducing agents. Hydro-halogen acids.*

0: None (or very low); 1: Slight; 2: Moderate; 3: High; 4: Severe.

***Reactivity Hazards**

Osmium tetroxide is a strong oxidizing agent. There is a risk of fire and explosion when it is mixed with combustible substances and other reducing agents. The amorphous allotrope itself is pyrophoric. Osmium tetroxide reacts with HCl, HBr, and HI to produce the free halogen. See Bretherick's *Handbook of Reactive Chemical Hazards* for details and for other incompatibilities.

Cited as known to be or reasonably anticipated to be carcinogenic in NTP-9? No Identified as a reproductive toxin in Frazier and Hage, *Reproductive Hazards of the Workplace*? No

Typical symptoms of acute exposures:

When inhaled, a burning sensation, coughing, headache, shortness of breath, visual impairment. On the skin, redness, severe burns. In the eyes, redness, pain, gritty sensation, blurred vision, loss of vision, deep burns. If ingested, a burning sensation, abdominal cramps, shock, collapse.

Principal target organ(s) or system(s):

Skin, eyes, respiratory system, gastrointestinal tract, kidneys.

Storage Requirements

Store separately, away from reducing agents and other poisonous oxidizers in a cool, dry, well-ventilated, locked location.

Additional Remarks

At ordinary temperatures, the vapor pressure of osmium tetroxide greatly exceeds the limits established by OSHA and ACGIH. Accordingly, users will be likely to be over-exposed to the vapors of this compound unless appropriate precautions are rigidly maintained; see the MSDS for details.

Notes**ReadMe**

This Chemical Laboratory Information Profile is *not* a Material Safety Data Sheet. It is a brief summary for teachers and their students that describes some of the hazards of this chemical as it is typically used in laboratories. On the basis of your knowledge of these hazards and before using or handling this chemical, *you need to select the precautions and first-aid procedures to be followed.* For that information as well as for other useful information, refer to Material Safety Data Sheets, container labels, and references in the scientific literature that pertain to this chemical.

Reproductive Toxins

Some substances that in fact are reproductive toxins are not yet recognized as such. For the best readily available and up-to-date information, refer to "DART/ETIC". See the TOXNET home page at www.sis.nlm.nih.gov and click on "Toxicology search". *Note that some of the data in DART/ETIC have not been peer-reviewed.* See also Linda M. Frazier and Marvin L. Hage, *Reproductive Hazards of the Workplace*; Wiley, 1998; and T. H. Shepard, *Catalog of Teratogenic Agents*, 9th ed.; Johns Hopkins University Press, 1998.

Abbreviations

ACGIH TLV—American Conference of Governmental Industrial Hygienists—Threshold Limit Value. C—Ceiling. CAS—Chemical Abstracts Service. mg/m³—milligrams per cubic meter. NA—Not applicable. NE—Not established. NI—No information. NTP-9—National Toxicology Program, Ninth Annual Report on Carcinogens. OSHA PEL—Occupational Safety and Health Administration—Permissible Exposure Limit. ppm—parts per million. STEL/C—Short-term exposure limit and ceiling.

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