

Basic Physical Properties

Osmium tetroxide (OsO_4 , CAS 20816-12-0) is a colorless or pale-yellow (with OsO_2 impurity) crystalline solid with an unpleasant, acrid, chlorine-like odor. OsO_4 is volatile (vapor pressure 7 mm Hg at 20 °C), it sublimates at room temperature.

Hazards

OsO_4 is highly poisonous. OsO_4 at concentration lower than the threshold for olfaction sensation can lead to pulmonary edema and subsequent death. OsO_4 will irreversibly stain the human cornea, which can lead to blindness. It is a severe irritant of the eyes and respiratory tract. Chronic exposure to OsO_4 can result in accumulation of osmium compounds in the liver and kidney and damage to these organs.

OsO_4 can penetrate plastics, and can cause fire if contacts with combustible materials



Osmium Tetroxide

Use Osmium Tetroxide

First, determine if you can use a less hazardous substance in place of osmium tetroxide.

OsO_4 solutions must be prepared and handled in a certified chemical hood. The solutions should be stored in labeled tightly sealed containers, and these should be placed in secondary containment. Secondary containment should be used anytime the material is transported to another lab location.

Personal Equipment Requirement:

chemical safety goggles; laboratory coat; closed-toed, leather shoes;

disposable nitrile gloves (not Latex), double gloving is recommended, change gloves frequently and when contaminated, punctured or torn, wash hands immediately after removing gloves;

Making OsO_4 Solution:

Dip the sealed ampoule into liquid nitrogen. Then break the vial and pour the osmium crystals into solvent. **OR** Break the ampule contains OsO_4 then put it into the solvent.

Quenching OsO_4 Solution:

(In fume hood) quench with corn oil, or aqueous solutions of sodium sulfide or sulfite

https://www.chemistry.ucla.edu/sites/default/files/safety/sop/SOP_Osmium_Tetroxide.pdf

https://www.ehs.harvard.edu/sites/default/files/lab_safety_guideline_osmium_tetroxide.pdf

http://cshprotocols.cshlp.org/content/2006/1/pdb.rec447.full?text_only=true