

# Osmium Tetroxide Handling Policy

Procedure: 6.20  
Version: 2.1  
Created: 04/31/2013  
Revised 4/18/2016

## A. Purpose

To ensure appropriate management and use of osmium tetroxide during research operations in laboratories.

## B. Applicability/Scope

This policy applies to all Columbia University laboratory personnel who store, handle or use osmium tetroxide.

## C. Responsibilities

1. Environmental Health and Safety (EH&S) is responsible for maintaining and enforcing this policy.
2. All Principal Investigators, administrators, and laboratory personnel at Columbia University are required to comply with this policy.
3. All PIs, administrators, staff and students working in laboratories at Columbia University are required to comply with the safety training requirements of EH&S as well as any task specific training required by either a laboratory PI or Senior Lab Staff member.

## D. Definitions

Osmium tetroxide: Osmium tetroxide (CAS# 20816-12-0) is a highly toxic colorless to pale yellow solid with an odor like chlorine; sharp and choking. The OSHA PEL is 0.002mg/m<sup>3</sup> is extremely low in comparison to other chemicals regulated by OSHA.

## E. Procedures

### 1. Use

The Safety Data Sheet (SDS) for osmium tetroxide should be consulted prior to use. Whenever possible the purchase of low percentage aqueous solutions should be made rather than concentrated solutions or solid material. Osmium tetroxide is normally available for purchase as a four percent aqueous solution in 5mL vials. Prior to use the solution is further diluted with water in a 1:4 ratio. Before starting work, a sign should be put up notifying lab staff that the chemical is being used.

### 2. Handling and Storage Safety

- a. Prior to starting work with osmium tetroxide, a sign should be put up notifying lab staff that the chemical is being used.
- b. Preparation of stock solutions and any operations capable of generating osmium tetroxide dust or aerosols should be conducted in a certified chemical fume hood to prevent inhalation. Additionally, all osmium tetroxide work should be done over bench pads or disposable covers. Two pairs of nitrile gloves, a lab coat, and indirectly vented chemical goggles should be worn at all times, as with working with any hazardous material.
- c. When working with osmium tetroxide, minimize the potential for exposure or spills by using the following guidelines:

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- i. Where practical, purchase pre-made dilute stock solutions from chemical manufacturers in lieu of preparing solutions.
- ii. If solutions of osmium tetroxide must be prepared, consider performing this process in a fume hood.
- iii. Perform all processes that generate osmium tetroxide dusts or mists inside the chemical fume hood to minimize inhalation exposures.
- iv. Prevent accidents by transporting small quantities of osmium tetroxide in secondary containment.

### 3. Collection and Disposal

Osmium tetroxide is listed as an acutely hazardous waste per USEPA and NYSDEC regulations and must be collected and managed as a hazardous chemical waste. Osmium tetroxide waste will be picked up directly from laboratories upon request via an online Chemical Waste Pickup Form: <http://vesta.cumc.columbia.edu/ehs/wastepickup/>.

- a. All solid chemical, concentrated or dilute liquid solutions, and osmium tetroxide contaminated debris or material must be collected and managed through the University's chemical/hazardous waste program.
- b. Pipette tips, razor blades, needles or other sharps contaminated with osmium tetroxide must be collected in a rigid, closed container and managed through the University's chemical/hazardous waste program.

### 4. Personal Exposure

In the event of personal exposure the following steps should be followed:

- a. Flush the area (eyes or skin) with water for 15 minutes.
- b. Seek further medical evaluation from Workforce Health and Safety at CUMC, or Saint Luke's Hospital Emergency Room at MS.
- c. Complete a University Incident Form.

### 5. Spill Response

- a. As with all hazardous materials, only manageable spills should be cleaned up by laboratory staff. If a spill is considered unmanageable, beyond the means of the laboratory worker, EH&S should be called to assist with the spill cleanup process.
- b. If there is a spill of osmium tetroxide and it is deemed manageable (i.e., quantity spilled is less than 2 mL), lab personnel should:
  - i. Alert other personnel in the area and isolate the area.
  - ii. Don appropriate PPE including, at a minimum, double nitrile gloves, a lab coat, and appropriate protective eyewear.
  - iii. Place an absorbing material or pad carefully on the spill and wait a few minutes.
  - iv. Scoop the material up and place it in a sealed plastic bag. Remove PPE carefully and place it in the bag.
  - v. Label the bag with appropriate orange "hazardous chemical waste" label and write osmium tetroxide clearly on the label.
  - vi. Complete an online hazardous waste pick-up request.

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## **F. Emergency Contacts –**

Public Safety – 212-305-7979 at CUMC or PS Office at your campus.  
EH&S - 212-305-6780 at CUMC or 212-854-8749 at MS campus

## **G. Cross References to Related Policies – N/A**

## **H. Medical Surveillance: -**

If persons working with Osmium Tetroxide experience any illness or other health effects from possible exposure, they must report to Workforce Health, Safety and/or NYP Emergency Room at the Medical Center campus or other healthcare provider as soon as possible to seek medical consultation

## **I. Record Keeping –N/A**

## **J. Appendices – N/A**

## **K. Forms – N/A**

## **L. References**

Occupational Health Guidelines for Osmium Tetroxide, (<http://www.cdc.gov/niosh/docs/81-123/pdfs/0473.pdf>)