VANDERBILT UNIVERSITY

Principal Investigator: Date Approved:

This Chemical Safety Protocol (CSP) covers basic chemical safety information for osmium tetroxide and supplements the laboratory Chemical Hygiene Plan as appropriate. Additional lab-specific safety operating procedures for osmium tetroxide may also be required. The use of osmium tetroxide is subject to pre-approval by the Principal Investigator (PI) and/or the designated Laboratory Responsible Safety Person. DO NOT USE OSMIUM TETROXIDE UNTIL YOU HAVE OBTAINED THE NECESSARY PRE-APPROVAL AND TRAINING.

Osmium Tetroxide

Osmium tetroxide (OsO_4) is an acutely toxic, corrosive solid that is used as an organic synthesis reagent, a stain for electron microscopy, and a fixative for biological samples. Osmium tetroxide can penetrate plastics and sublimes at room temperature and atmospheric pressure. It can be fatal if ingested, inhaled, or absorbed through the skin. Osmium tetroxide causes severe skin burns and eye damage. Specifically, OsO_4 can stain the cornea of the eye and cause blindness.

Personal Protective Equipment & Personnel Monitoring

Lab Coat

Traditional lab coat or flame resistant lab coat when working with flammable materials.

Gloves

Two pairs of neoprene gloves. If the glove is chemically exposed, the outer glove must be removed and replaced immediately.

Eye Protection

ANSI Z87.1-compliant safety goggles, or a face shield if a splash hazard is present

Face Shield

Labeling & Storage

Store in glass at sub-ambient temperatures and keep containers tightly closed to limit sublimation. **Do not use plastic containers**. Each container's label must include a skull-and-crossbones pictogram, the word "Danger", and identify the material as acutely toxic. Keep in a dry, well-ventilated place. Osmium tetroxide containers must be stored in leak-proof secondary containment within a Designated Area. The secondary container's label must include a skull-and-crossbones pictogram, the word "Danger", and identify the material as acutely toxic. Also, if not plainly visible (e.g. through a cabinet window), labeling must be applied to storage locations where these are stored to avoid an inadvertent encounter. Incompatibilities include strong reducing agents, organic materials, powdered metals, and hydrochloric acid – contact will cause formation of poisonous chlorine gas.

Engineering Controls, Equipment & Materials

Fume Hood	Use a fume hood to keep exposure to osmium tetroxide vapors as low as possible. If your protocol does not permit the handing of this chemical in a fume hood, contact the Office of Environment, Heath, Safety, and Sustainability (EHSS) to determine whether additional respiratory protection is warranted.

Housekeeping

Releases	Immediately notify others in the area of the release and evacuate the location where the release occurred. Notify your PI/Responsible Safety Person and call Vanderbilt University Public Safety (VUPS) at 615-421-1911 or use the Vandysafe app on your smart phone. Report any exposure through Risk and Insurance Management's Origami portal and mark that it occurred in research when prompted. Both VUPS and the Origami system will notify EHS of the incident. Remain on-site at a safe distance to provide detailed information to first responders.
Decontamination	Clean contaminated surfaces with soap and water. Dispose of contaminated paper towels as solid hazardous waste.
Waste	Refer to the laboratory *Chemical Hygiene Plan* (Section 6.7) for information on proper chemical waste disposal procedures.

First Aid & Emergencies

Skin Contact	Immediately remove contaminated clothing and shoes and flush skin with water for at least 15 minutes. Get medical attention immediately. *Serious skin contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.
Eye Contact	Check for and remove contact lenses. Immediately flush eyes with water for at least 15 minutes. Get medical attention immediately.
Inhalation	Move person into fresh air. Get medical attention immediately.
Ingestion	Do not induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Get medical attention immediately.

Name	Signature	Date