

METAL CARBONYLS

STANDARD OPERATING PROCEDURE

Type of SOP: Process Hazardous Chemical Hazard Class

Department: _____ **Building:** _____ **Room #:** _____

Principal Investigator: _____ **Phone #:** _____

Prepared By: _____ **Email:** _____ **Date:** _____

1. HAZARD OVERVIEW



Metal carbonyls are very toxic. The extreme toxicity of metal carbonyls is due to:

- The release of carbon monoxide (both in storage and once inside the body);
- The toxicity inherent to the metal center; and
- The reactivity of each individual metal carbonyl complex.

Due to the generally high volatility of lower molecular weight metal carbonyls exposure due to inhalation is a notable risk and may be fatal if inhaled. Nickel carbonyl is one of the strongest known inhalation poisons. Other forms of exposure are skin permeation as well as accidental ingestion.

Metal Carbonyls may be fatal through both skin absorption and ingestion. Some metal carbonyls are air reactive chemicals which can be flammable, pyrophoric, and/or form explosive mixtures in air. Additionally, they are heat and light sensitive.

2. PERSONAL PROTECTIVE EQUIPMENT (PPE)

At minimum, complete protection of the eyes and skin is essential. Additional or more protective PPE may be required. Please refer to the NJIT Chemical Hygiene Guide and Hazard Assessment Form to determine the proper PPE for handling corrosive materials.



3. ENGINEERING/VENTILATION CONTROLS

Metal Carbonyls should be used in a properly functioning chemical fume hood. Please review the NJIT Chemical Hygiene Guide and the Safe Chemical Fume Hood Use Guide for information on the proper use of a chemical fume hood and criteria for implementing engineering controls.

Chemical Fume Hood Glovebox Biological Safety Cabinet Other _____

Room Location of Unit(s): _____

4. SPECIAL HANDLING PROCEDURES AND STORAGE REQUIREMENTS

Precautions for safe handling: Avoid contact with skin and eyes. Avoid inhalation of vapor or mist. Use explosion-proof equipment. Keep away from sources of ignition/sparks. Take measures to prevent the build-up of electrostatic charge.

Conditions for safe storage: Store in cool place. Keep container tightly closed in a dry and well-ventilated place. Toxic carbon monoxide can be released during storage and could be fatal without adequate ventilation. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Recommended storage temperature: 2 - 8 °C (*always store inside a refrigerator that is approved for flammable chemical storage*). Heat, air & light sensitive. Handle and store under inert gas. Always follow the specific storage information provided by the supplier.

5. INCIDENTS AND ACCIDENTS

Laboratory personnel are to report all occupational injuries or illnesses to Faculty/PI as soon as practical. The Faculty/PI and laboratory personnel must submit the required paperwork to NJIT EHS Department. See the the Emergency Response Guidelines posted in the laboratory or Emergency Procedures section of the NJIT CHG for proper procedures involving an injury, exposure, fire, or release/spill of a hazardous material.

In the event of an emergency, DIAL 9-1-1 to activate emergency response personnel.

6. SPILL AND DECONTAMINATION

Wear proper PPE. Decontaminate equipment and bench tops using soap and water, or other appropriate decontamination/cleaning solution. Dispose of all used contaminated disposables in the appropriate waste stream following the Waste Disposal Section of the NJIT CHG.

Decontamination Solution(s): _____

Additional Spill / Decontamination Requirements:

7. WASTE DISPOSAL

Follow the practices and procedures in accordance with the NJIT Laboratory Waste Management Program to properly dispose of waste.

Additional Waste Disposal Requirements:

8. PRIOR APPROVAL/REVIEW

9. DESIGNATED USE AREA

Designated Use Area Location(s): _____

10. SAFETY DATA SHEETS

Location of SDS: _____

11. LAB-SPECIFIC INFORMATION (required) ([Examples](#) of appropriate content)