Propylene Oxide

1. **Process**
    a. Working with propylene oxide as a solvent or a reagent.

2. **Describe process, hazardous chemical, or hazard class**

    a. Propylene oxide is an epoxide group with an additional methyl group. This highly volatile liquid is an excellent solvent for epoxy resins and other epoxide containing organic systems.
        i. This SOP covers the use of propylene oxide in laboratories for the following purposes:
            1. The use of propylene oxide as a transitional solvent for embedding tissues in electron microscopy.
            2. The use of propylene oxide as a general laboratory solvent for epoxide containing compounds.
            3. The use of propylene oxide as a synthetic precursor.

3. **Potential Hazards**
    a. Propylene oxide is a class 2 carcinogen. This means that propylene oxide is known to cause cancer in laboratory animals and is reasonably believed to cause cancer in humans.
    b. Propylene oxide is highly flammable with a flash point of -37 C.
    c. Propylene oxide is a highly reactive organic molecule. Very careful attention to chemical compatibility should be given. Propylene oxide is highly reactive with oxidizing agents (including peroxides) and is also reactive with acids, bases, and copper metal.

4. **Personal Protective Equipment**
    a. Propylene oxide does present a hazard to the eyes. If used in any quantity that could result in a splash in the eyes, appropriate protective eyewear should be used. Indirectly vented goggles should be used if volumes greater than 10 mL are being used.
    b. Wear a 100% cotton laboratory coat when working with propylene oxide.
    c. Wear gloves when handling propylene oxide. Most standard laboratory gloves are **NOT** recommended for use with propylene oxide. Polyvinyl alcohol (PVA) gloves are recommended for use where propylene oxide should not contact the glove in normal use. If propylene oxide does come into contact with a PVA glove, the propylene oxide should be wiped off with a paper towel and the paper towel placed in a Ziploc bag, the glove should be removed, and hands washed with soap and water. The PVA gloves can then be washed with soap and water

and re-used as long as the removal of propylene oxide form the surface is done very quickly. PVA gloves should always be inspected for signs of contamination, degradation, and physical damage (punctures, slits) prior to use.

5. Engineering Controls

a. All work with propylene oxide shall be performed behind in a fully functional and certified fume hood.
b. Work with propylene oxide should be done on a small scale whenever possible.

6. Special Handling Procedures and Storage Requirements

a. Treat propylene oxide with great care. Avoid any possible sparks or other sources of ignition when working with propylene oxide.
b. Take extra precautions to avoid contact with propylene oxide such as the use of the personal protective equipment described above.
c. Propylene oxide should be stored with other flammable materials separate from oxiziders. Any contact with organic peroxides or hydrogen peroxide should also be strictly avoided.
d. Propylene oxide should be stored in the dark and should not be exposed to excessive direct sunlight.
e. Propylene oxide should be stored away from strong acids and bases.
f. Propylene oxide should not come into contact with copper metal.

7. Spill and Accident Procedures

a. Small spills: Do not attempt cleanup if you feel unsure of your ability to do so or if you perceive the risk to be greater than normal laboratory operations. Absorb the spill in vermiculite if spill is contained in a well-ventilated area like a fume hood. The contaminated vermiculite can be collected in a Ziploc bag for disposal.
b. Large Spills: Notify others in area of spill. Turn off ignition sources in area. Evacuate area and post entrance ways to spill area. Call NAU Police at 911 for spill response. Restrict person from area of spill or leak until cleanup is complete. Remain in area in safe location to assist the EH&S response.

8. Decontamination Procedures

a. If a small amount of propylene oxide is spilled on a PVA glove, wipe the propylene oxide off of the glove with a paper towel and place the paper towel in a solid waste collection bag (Ziploc is OK). Hands should be washed with soap and water. The PVA gloves can then be washed with soap and water and re-used as long as the removal of propylene oxide form the surface is done very quickly.

9. Waste Disposal Procedures

a. Contact EH&S for waste disposal. Please call EH&S prior to generating waste to discuss the safest method for storage as well as compatible waste components.

10. Safety Data Sheet Location

a. Safety Data Sheets must be available