

## Standard Operating Procedure (SOP)



### DIETHYL ETHER (ETHER, ETHYL ETHER)

Effective Date: 8/23/2013

Revised Date: 8/23/2013

#### INTRODUCTION

- This SOP applies to DIETHYL ETHER
- Ether is highly volatile and extremely flammable as a liquid or vapor. It is considered one of the most dangerous fire hazards commonly used in the lab due to its volatility and extremely low ignition temperature.

#### GENERAL LAB RULES

1. No eating, drinking, smoking, handling contact lenses, or applying cosmetics in the laboratory.
2. Persons shall wear buttoned lab coat, long pants, safety glasses or goggles and appropriate gloves when working with hazardous chemicals.
3. Mouth pipetting is prohibited; mechanical pipetting devices are to be used at all times.
4. All procedures are performed carefully to minimize the creation of splashes or aerosols.
5. Wash hands
  - after handling chemicals materials,
  - after removing gloves, and
  - before leaving the laboratory.

Additional Lab Specific Rules Here

#### POTENTIAL HAZARDS

- Ether will spontaneously ignite at temperatures at or above 160°C (320°F).
- Ether vapor forms explosive mixtures in air at concentrations of 1.9-36% by volume.
- Ether may react violently with halogens or strong oxidizers (e.g. perchloric acid, nitric acid).
- Ether can form explosive peroxides upon storage in contact with air.

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#### HEALTH HAZARDS

- Inhalation of high concentrations of ether vapor can result in sedation, unconsciousness, and respiratory paralysis.
- Ether is mildly irritating to the eyes and skin. Repeated skin contact can result in dryness and cracking due to removal of skin oils.
- Chronic exposure to ether vapors can lead to loss of appetite, exhaustion, dizziness, drowsiness, and other central nervous system effects.

#### PERSONAL PROTECTIVE EQUIPMENT

##### EYE PROTECTION

- Safety glasses, goggles or face shields shall be worn during operations in which DIETHYL ETHER might contact the eyes (e.g., through vapors or splashes of solution).
- Ordinary (street) prescription glasses do not provide adequate protection. Adequate safety glasses must meet the requirements of the Practice for Occupational Education Eye and Face Protection (ANSI Z87.1-1989) and must be equipped with side shields.

##### HAND PROTECTION

- Use disposable nitrile gloves when working with chemicals. Check chemical compatibility chart for breakthrough time when using
- Laboratory personnel should thoroughly wash hands with soap and water before and immediately upon removal of gloves.

##### LAB COATS, ETC.

- Button lab coats, closed toed shoes, long pants and long sleeved clothing shall be worn when handling DIETHYL ETHER. Protective clothing shall be worn to prevent any possibility of skin contact with DIETHYL ETHER.

#### WORK PRACTICES

- All DIETHYL ETHER work shall be done in the laboratory fume hood.
- Never open a dented or otherwise compromised container of ether.
- Purchase ether with inhibitors added (for peroxide-forming) when possible.
- Due to its peroxide-forming hazard, ether containers shall be dated upon receipt and at the time they are opened. If tested, note the date it was tested.
- Periodically test ether containers with peroxide test strips.
- Do not allow to evaporate to near dryness unless absence of peroxides has been shown.

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- Eliminate ignition sources such as open flames, hot surfaces, steam baths, and operation of mechanical and electrical equipment that is not intrinsically safe.
- Ensure proper grounding and avoid creating static electricity.

#### SPECIAL HANDLING PROCEDURES AND STORAGE REQUIREMENTS

- Do not store with incompatible material.
- Ether is to be stored in a designated flammable cabinet.
- Ether may not be stored in a refrigerator that is not labeled as intrinsically safe for flammables.

Additional Lab Specific Special Handling/Storage Procedures

#### WASTE DISPOSAL

- DO NOT open or move any ETHER container that has developed crystals at the lid. Call x3427 immediately.
- Ether must be checked for the presence of peroxides prior to removal.
- Excess DIETHYL ETHER and all waste material containing DIETHYL ETHER must be placed in a container labeled with the following **“HAZARDOUS WASTE DIETHYL ETHER”**.
- Contact EHS at x3427 for hazardous waste removal.

#### EMERGENCY PROCEDURES

**Emergency Numbers:**

Fire and Medical Emergencies	x5911 (911 on cell phone)
Environmental Health and Safety	x3427
Hillcrest Urgent Care (employees)	336-760-8999
Student Health (students only)	x5218
Poison Control	800-222-1222

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#### FIRST AID

1. If inhaled: If breathed in, move person into fresh air. If not breathing, give artificial respiration. Call x5911 for medical assistance.
2. In case of skin contact: Take off contaminated clothing and shoes immediately. Wash off in safety shower for at least 15 minutes. Call x5911 for medical assistance.
3. In case of eye contact: Rinse thoroughly with plenty of water at eyewash for at least 15 minutes and call x5911 for medical assistance.
4. If swallowed: Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Call x5911 for medical assistance.
5. Call x5911 and describe the extent of injuries.
6. Report all accidental exposures to EHS and Human Resources (employees) or Student Health (students).
7. Complete an [online injury/illness report](#) if there is an over-exposure to the chemical or if there is an accident involving the chemical.

#### SPILL AND ACCIDENT PROCEDURES

SPILL QUANTITY	PROPER SPILL RESPONSE
Spill less than 500 mL	Contact Environmental Health and Safety (x3427) and clean up spill using spill kit.
Spill greater than 500 mL	Do not attempt to clean up spill. Leave the area and immediately report to WFU Police (x5911) and EHS (x3427).