Chemistry
UNIVERSITY OF TORONTO

Lash Miller Laboratories St. George Campus

CHEM -SOP- 11b	Revision #: 01	Implementation Date: 2019-10-07	Last Reviewed/ Update: 2019-10-07	Page #: 1 of 3 Appendix (p4)

Standard Operating Procedure: TRANSPORTING CRYOGENIC LIQUIDS

NOTE: Refer to Appendix 1 for Elevator Signage Required to Transport Cryogens

Hazards:

- **Asphyxiation hazard due to oxygen displacement**
- **Extreme cold hazard causing rapid frost burn**

1. Purpose: to provide step by step guidance on how to transport cryogenic liquids between floors and within the Lash Miller building.

2. Scope: applies to all students, staff and faculty within the Department of Chemistry needing to work with cryogenic liquids. A cryogenic liquid is defined as a liquefied gas that is stored or used at cryogenic temperatures which is defined by NIST as being below 93.15 K (-180°C).

3. Prerequisites: You must be trained by an experienced person in your laboratory or by Chemical Stores staff.

4. Responsibilities: It is the responsibility of all Faculty, staff and students to follow the procedures described in the SOP. Faculty members are required to provide PPE, ensure appropriate safety training, and ensure all appropriate precautions are being followed.

5.

Personal Protective Equipment (PPE):




6. Vessels for Transporting Cryogenic Liquids

1. All vessels used to transport cryogenic liquids shall meet ISO 21009-1 or equivalent. Vessels must be specifically designed for use with cryogens.
2. Vessels must have a pressure release system to ensure that pressure cannot build up resulting in an explosion. For example, a Dewar flask should contain a cover that allows for boiled off gases to escape.

7. Transporting Cryogenic Liquids within Lash Miller

1. Ensure all appropriate PPE is worn correctly, which includes: long pants, closed-toe shoes, lab coat, face shield and cryogenic gloves.
2. Transport cryogenic vessels in handcarts with a lip to prevent any potential for spills, or using devices specially designed for moving cryogenic liquid vessels.
3. In the event of a spill, remove contaminated clothes immediately as cryogens penetrate clothing much more quickly than water. For large spills, leave the area immediately and call 416-978-7000.

8. Transferring Cryogenic Liquids between Floors

1. Before attempting to transport cryogens, acquire the help of an associate and ensure that they are stationed at the destination point.
2. Only transport cryogenic liquids between floors using the freight elevator. In the event that the freight elevator is out of service, consult with the Director of Operations and Technical Services or the Manager of Chem-Labs Technical Support and Services for assistance.
3. Place the cryogenic vessel within the elevator.
4. Barricade the elevator at the both the rear and front entrances by utilizing the retractable belt barriers mounted within the elevator.

5. Affix the signage in Appendix 1 onto the belt barrier.

6. Press the floor button of the destination point and exit the elevator. Under no circumstances are passengers allowed to travel in an elevator with cryogenic liquids.
7. The associate at the destination point shall then remove the cryogenic vessel from the elevator and remove the belt barriers and signage.
8. The exception for this procedure is for quantities less than 1L of cryogenic liquids, as this quantity would not be enough to cause asphyxiation in the freight elevator.

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Adapted from; University of Toronto Environmental Health & Safety Standard for Inert Cryogenic Liquid Usage in the Laboratory

APPENDIX 1

WARNING

Please wait for the next elevator

Hazardous Substance Being Transported

WARNING

Asphyxiation Hazard