Using liquid nitrogen to flash freeze biological samples

Department: Chemistry & Chemical Biology
Date SOP was written: July 1, 2014
Date SOP was approved by PI/lab supervisor: Andy LiWang
Reviewed by: Andy LiWang
Principal Investigator: Andy LiWang
Internal Lab Safety Coordinator/Lab Manager:
Lab Phone: 209.228.4630
Office Phone: 209.228.4631
Emergency Contact: Karen Smith
209.205.8176

Location(s) covered by this SOP: Castle 1201 Suite 920

Type of SOP: X Process ☐ Hazardous Chemical ☐ Hazardous Class

Purpose

This SOP covers using liquid N₂ to flash freeze biological samples.
Summary of Significant Health and Physical Hazards

- Liquid $N_2$ is dangerously cold (77 K; -196 °C; -321 °F). Thus, insulating gloves, lab coat, and eye protection are required when filling the magnet with liquid $N_2$.

Risk Assessment

The overall health and safety risk for use of this spectrometer in accordance with the procedure and protocol in the following section is considered **LOW** based on:

- Serious injury from exposure to liquid nitrogen is low for this procedure.

Personal Protective Equipment (PPE) Required to Handle Liquid Nitrogen ($N_2$)

- Gloves
- Thermal insulating gloves
- Safety Eye Goggles
- Lab Coats
- Close-toe shoes

Protocol/Procedure

Preparatory Steps:

- Review special handling and the emergency information contained in this SOP.
- Visually verify that access to the emergency eyewash/shower unit and the fire extinguisher are not blocked.
- Visually verify that access to the emergency exit door is free obstructions.
- Don the appropriate protective equipment.

Laboratory Procedure

Pouring liquid nitrogen ($N_2$) into cold insulating cylinder for flash freeze biological samples

1. Place cold insulating cylinder on to a stable and easy access surface, slowly pour liquid nitrogen ($N_2$) from the liquid nitrogen ($N_2$) storage container into the cold insulating cylinder. Fill to equal or less than half full.

2. Use a pair of long tweezers to clamp biological samples and then dip into the cold insulating cylinder. Wait a minute. Samples should be frozen now. Take out the biological sample with the tweezers.
3. Pour the remaining liquid nitrogen (N\(_2\)) from the cold insulating cylinder back to the liquid nitrogen (N\(_2\)) storage container.

4. Cover the storage container with its lid.

In the event of an injury, perform first aid and call 911 and report to Environmental Health and Safety at 209.228.4261.
Documentation of Training (signature of all users is required)

- Prior to conducting any work with the chemicals listed above, designated personnel must provide training to his/her laboratory personnel specific to the hazards involved in working with this substance, work area decontamination, and emergency procedures.

- The Principal Investigator must provide his/her laboratory personnel with a copy of this SOP and a copy of the SDS provided by the manufacturer.

- The Principal Investigator must ensure that his/her laboratory personnel have attended appropriate laboratory safety training or refresher training within the last one year.

I have read and understand the content, requirements, and responsibilities of this SOP:

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