

LSOP Title	Refilling and using liquid nitrogen
LSOP No.	LSOP51
Version	1.1
Location	UQ Node/Centre-wide
Policy/Procedure Link	UQ- Equipment UQ-2.70.20 - LN2
Risk Assessment	
Approved by	Elizabeth Dun
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Next Review Date	11.10.2022
Contact for Assistance	plantsuccess@uq.edu.au

1.0 Scope

This procedure covers the use and storage of liquid nitrogen. It includes information on safety, transport, PPE and operating procedures.

It does not cover detailed instructions pertaining to individual experiments.

2.0 Definitions

LN₂ - Liquid nitrogen
Dry ice - Solid carbon dioxide
SDS - Safety Data Sheet
OHS - Occupational Health and Safety
PPE - Personal Protective Equipment
SCBA - Self Contained Breathing Apparatus
SOP - Safe Operating Procedure
WHSC - Workplace Health and Safety Coordinator
Bldg – building

3.0 Materials and Equipment

1. Liquid Nitrogen
2. Dewar
3. Tongs
4. PPE
5. Gloves

4.0 Prescribed Actions

All personnel are required to complete Laboratory and Chemical Safety Training. Training is completed at the SCMB Chemistry Store at the back of Bldg 68. It runs fortnightly on a Friday at 11am sharp. Contact keys@scmb.uq.edu.au to arrange training and access.

How to collect LN₂ from SCMB:

1. Take dewar on the trolley (see figure 1) and walk to the LN₂ dispensing unit at the back of SCMB building 68
2. Put on the safety apron, gloves and face shield
3. Remove the dewar lid
4. Place the LN₂ dispenser into the dewar
5. Follow the prompts on the system
 - a. Touch ID card
 - b. Choose account (this should be the Biol Sci Beveridge Account)
6. Ensure dispenser is in place and then start dispensing (see figure 2)

LABORATORY STANDARD OPERATING PROCEDURE (LSOP)

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Figure 2: Dispensing liquid nitrogen into dewar at Blg68

7. To measure amount of liquid in the dewar briefly place the wooden stick inside to estimate height of liquid
8. When the liquid is 80% of the dewar, stop dispensing
9. Place the lid back on the dewar
10. Replace equipment back as you found it
11. Walk the full dewar, strapped to the trolley, back to the lab

Safety:

1. Main hazards are cryogenic burns and injuries and asphyxiation

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2. Liquid nitrogen must be transported and stored in vessels designed and approved for cryogenic fluids.
3. Dewar is a non-pressurised, double-walled insulating vessel with loose fitting insulated caps for the venting of vapours.
 - a. Do not fill to more than 80% capacity
 - b. Store in a secure, dry, cool, well-ventilated place away from heavy traffic and combustible materials.
 - c. Store upright on a firm level floor, and secure to prevent tipping or falling.

Transport:

1. Under no circumstances should liquid nitrogen be transported in an enclosed vehicle.
2. A suitable trolley which can secure the Dewar can be used to transport LN₂ from source to laboratory (see figure 1)



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Figure 1: Dewar on a suitable trolley

3. If a lift is used to transport the Dewar then the lift should be closed to passengers. It should never be accompanied in the lift due to the risk of asphyxiation. A sign needs to be placed across the elevator and someone should be waiting at the destination floor to collect the Dewar.

PPE:

1. A full face-shield or safety goggles to protect the eyes when handling liquid nitrogen
2. Loose fitting, dry, cold insulating or leather gloves that can be easily removed in the event of splashes entering a glove. Do NOT wear rubber gloves.
3. Laboratory coat with long sleeves and no cuffs to protect the arms
4. Closed leather boots or shoes that are easily removed in the event of a splash entering a boot or shoe.
5. Long pants should be worn.

Operating Procedure:

1. Wear PPE
2. Work in a well-ventilated area
3. Do not work alone; a second person should always be on standby when liquid nitrogen is being used or transported.
4. Avoid direct contact of liquid nitrogen and its vapours with the skin and eyes. Avoid inhalation of vapours.
5. Use containers and tools designed for use with cryogenic materials. Do not use glass vessels.
6. Use tongs to place and remove objects into or from liquid nitrogen.
7. Pouring liquid nitrogen or immersing objects should be done slowly and carefully to minimise boil off and splashing. Never pour from a height above eye level.
8. No activities using liquid nitrogen should be brought close to the face or ears.
9. Liquid nitrogen must not be put into a vessel and sealed due to the risk of an explosion.
10. Small amounts of surplus liquid nitrogen may be allowed to boil off as a gas in an operating fume cupboard or in a well-ventilated area.
11. Liquid nitrogen must not be poured down sinks or drains.

5.0 Monitoring and Review

This CSOP will be reviewed annually, or as may be otherwise required because of changes to ARC requirements or changes to institutional policy and procedure.