University of Regina

SAFETY ADVISORY

Rapid Expansion Dangers: Why Properly Storing Cryovials with Liquid Nitrogen Is Important

Health, Safety and Wellness is aware of instances of improper storage and handling of cryovials in liquid nitrogen dewars on campus.

Please note: When storing vials within the liquid phase of a liquid nitrogen dewar, the liquid nitrogen can leak into the vials during immersion. Once it warms to room temperature, nitrogen will rapidly expand. This evaporation in a sealed container can create pressures greater than 10,000 psi. Consequently, the vial can shatter when removed from storage, creating a hazard from both flying debris and content exposure.

Best practice is to store cryovials in the vapour phase, rather than the liquid phase of the dewar. Most manufacturers of cryovials are not equipped for liquid-phase storage.

Use the following precautions for handling and storing cryovials in liquid nitrogen:

- Wear cryogenic gloves, lab coat, impact-resistant and full-face shield, as well as closed-toe shoes.
- Do not overfill cryovials beyond the designated fill line, as doing so increases the risk of cracking and possible content release.
- When liquid-phase storage is necessary, use specialized cryoflex tubing or other safety enclosures that can be heat-sealed to prevent the entry of liquid nitrogen into cryovials. **Remember**: Improper use of these items may result in violent rupture.
- For cryovials immersed in liquid-phase storage, place tubes in a sealed, unbreakable, plastic container immediately after removal from storage and prior to thawing. Tubes can also be moved from the liquid phase to the vapour phase for at least 24 to 48 hours prior to removing from the storage container.

The University of Regina is committed to the health, safety and wellbeing of all its community members, as well as to the provision of a safe and healthy work and study environment.

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