Protocol 1007

Snap Freezing in Liquid Nitrogen (LN2) Using a CoolRack® module and ThermalTray™ platform

INTRODUCTION

For snap freezing large sample sets in liquid nitrogen, the use of a low profile ThermalTray SLP platform in an insulative pan creates a raised cryogenic table above the LN2 surface. This elevates the thermo-conductive CoolRack module, providing increased safety distance between hands and the liquid. The ThermalTray platform can handle multiple CoolRack modules and easily accommodates up to 96 sample tubes.

A CoolRack module on a ThermalTray SLP in liquid nitrogen provides a very stable cryogenic temperature environment for sample tube processing such as snap freezing, temporary cryogenic temperature holding and cell vial reorganization.

Materials

- Insulated ice pan
- ThermalTray SLP
- CoolRack module
- Liquid Nitrogen

Snap Freezing Using a ThermalTray Platform

1. Place ThermalTray SLP platform into the pan. (Fig. 1)
2. Add liquid nitrogen up to the level of the tray table. Place one or more CoolRack modules on the ThermalTray SLP and allow to come to temperature approximately 12-15 minutes to reach -140°C. (Fig. 2)

Fig. 1

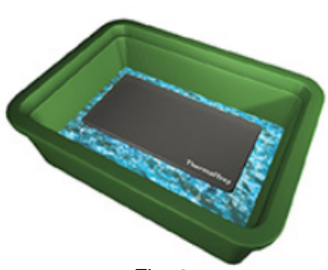


Fig. 2

3. Samples may now be added to the CoolRack module and will remain at approximately -138°C or below as long as there is at least 0.5cm of liquid nitrogen touching the ThermalTray SLP platform. Refill as needed (typically every 1 to 1.5 hours. (Fig. 3)

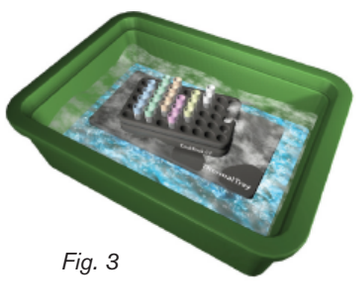
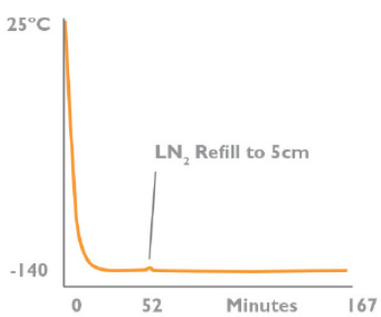


Fig. 3

Performance Data



A CoolRack module on a ThermalTray SLP platform was placed in a pan containing 5cm of LN2. When the LN2 evaporated to the depth of 0.5 cm (52 minutes) it was re-filled to 5cm. The CoolRack module temperature remained between -139.0°C and -140°C during the 115 minute interval for the LN2 to again reach a level of 0.5 cm.

Note: It is important to adhere to laboratory safety protocols when handling dry ice or liquid nitrogen. CoolRack and ThermalTray modules can cause skin burns when cooled to ultra-low temperatures. Use extreme caution and appropriate protective clothing and equipment when liquid nitrogen and cryogenic temperature materials.