

Safetygram

NCI-Frederick

ISM-184

Laboratory Personnel

March 2013

Oxygen Deficiencies and Cold Rooms

Air flow in cold rooms differ from laboratory and office environments. Unlike offices and labs, air in cold rooms is recirculated without the opportunity for outside air exchange. This condition is fundamental to the design of these rooms to ensure proper temperatures.

Due to this situation, careful attention must be given to activities performed in these areas. Oxygen depletion is a serious possibility if certain safety guidelines are not observed.

- X Do not store dry ice or packages containing dry ice in walk-in refrigerators or freezers. As the dry ice sublimates, gaseous carbon dioxide is released and may accumulate to dangerous levels, displacing oxygen in the room in extreme cases.
- X Leaks of inert compressed gases such as nitrogen and argon may also displace oxygen in a cold room. If cylinders of these gases must be used in a cold room, an oxygen monitor must be present to warn of oxygen-deficient atmospheres.
- X Toxic gases and volatile liquids must not be used in cold rooms. Concentrations of these substances may become great enough to cause illness and even death.
- X Cold rooms are not explosion-safe. Electrical fixtures within the room such as outlets, switches and relays may spark when operated. Therefore, flammable liquids and gases must not be used in these rooms.

Liquid nitrogen will also displace oxygen in the atmosphere if sufficient amounts are present in areas with inadequate ventilation. Liquid nitrogen expands to approximately 700 times its original volume when it evaporates. Therefore, operations involving liquid nitrogen should be conducted in well ventilated areas to prevent the displacement of atmospheric oxygen by nitrogen gas. For additional information on the safe use of liquid nitrogen, refer to Safetygram ISM-176.

If you have any questions about cold rooms and potentially oxygen-deficient atmospheres, please contact EHS at x1451.