UNIVERSITY OF BERGEN
Department of Biological Sciences

WORK INSTRUCTION DRY ICE

Dry ice is CO_2 in solid form and has a temperature of -78 ° C. It can cause severe frost damage upon skin contact. Dry ice sublimates (evaporates) directly to CO_2-gas that displace air and can cause suffocation.

Dry ice is not classified in accordance to Regulation (EC) No.1272/2008 [CLP], and therefore no pictograms or hazard statements are associated with this product.

Other hazards

Asphyxiant in high concentrations.
Refrigerated solidified gas. Contact with product may cause cold burns or frostbite.
In high concentrations CO2 causes rapid circulatory insufficiency even at normal levels of oxygen concentration. Symptoms are headache, nausea and vomiting, which may lead to unconsciousness and death.

Characteristics

At 15 °C, 1 kg of dry ice will expand to 530L when it sublimates to gas form.
CO_2 gas is 1.5 times heavier than air, colorless and odorless. This means that the gas displaces air in a room and can therefore pose a suffocation hazard for people working with dry ice.
A single sublimation test showed that 20-25 % of the dry ice sublimated at - 20° C within one day. At room temperature 50-60% sublimated within a day.

The administrative standard for work, limit of harmful exposure to carbon dioxide gas is 5000 ppm (0.5% of the volume of inhaled air).

Purchasing

Contact your lab manager when ordering dry ice.

Handling

- Use protective gloves, lab coat and eye protection when handling dry ice.
- Working with dry ice requires good ventilation. Do not use dry ice in small rooms without sufficient ventilation. If in doubt, use a CO2 gas meter. Contact the gas manager at BIO for access to a CO2 meter.

Storage

Freezer rooms should not be used for storage of dry ice due to lack of ventilation system.

Dry ice should only be stored in ultra freezers that are marked for this purpose. Contact your lab manager for questions related to storage of dry ice. If it is necessary to store larger amounts of dry

ice, other ultra-freezers can be used. The BIO Emergency Guard (453 92 771) must be informed, and the freezer marked. Larger amounts of dry rice should not be stored for a long time.

Available ultra freezers for storage;
- A-building, room 2B07
- BIO-blokken, 526B1 and 432B2

Be aware of sublimation of dry ice also occurs in ultra freezers. The CO_2-gas will build up in the bottom of the freezers and easily reach dangerous high concentration. Do not put your head inside the freezer where dry ice is stored.

Transport of dry ice by car

Any transport with dry ice must be risk assessed in advance. It is important to consider the following points in a risk assessment, amount of ice, time, temperature, volume, and ventilation.
Dry ice mut be transported by vehicle with separate cargo space and driver's compartment. Ensure adequate ventilation before entering the cargo compartment of a truck carrying dry ice.
Ordinary passenger car/station wagon with no assigned cargo space is not suitable for transport of dry ice, including transport of samples chilled on dry ice. Even small amounts of dry ice over short distances can cause poisoning in a small room like a passenger car, if you do not provide good ventilation.

- The "Bildeleringen" has cars with separate cargo spaces.
- Transport of dry ice can be purchased from a transport company approved for such transport.
- For smaller amounts of dry ice over short distances, you can order transport by bicycle or motorcycle. Both are faster than cars inside the city.
- Consider whether regular blue ice can be an alternative for cooling.

Symptoms when inhaling CO_2-containing air

2-4%: Increased breathing activity and headache.
4-6%: Headache, feeling sick and vomiting. May cause unconsciousness if the affected person does not quickly get into fresh air.
> 10%: Circulatory disturbances leading to coma and death.
Good ventilation is therefore important in handling and storing dry ice.

First aid measures

Inhalation: Remove the person to uncontaminated area wearing self-contained breathing apparatus. Think of your own safety first before evacuation a person that might have been exposed to high level of CO_2. Keep the person warm and rested. Call a doctor. Perform cardiopulmonary resuscitation if breathing stopped.

Skin contact: In case of frostbite spray with water for at least 15 minutes. Obtain medical assistance.

Legevakt: 116 117

Emergency: 113

All accidents should be reported as HSE non-conformities.

References:

Safety data sheet for dry ice, Nippon Gases.