

**STANDARD OPERATING PROCEDURE**

**Carbon Dioxide (Dry Ice)**

According to the Safety Data Sheet (SDS) special precautions must be taken when working with the chemical described above. The following information includes the chemical characteristics of followed by recommendations for handling and any paperwork needed in order to use the chemical in the laboratory. This Standard Operating Procedure will be followed along with the requirements of the Chemical Hygiene Plan.

GHS Classifications: **Signal Word: Warning**

 **Pictograms: Acute Toxicity Hazard**

Brief description of proposed chemical work: **Dry ice is the solid form of Carbon Dioxide and primarily used as a cooling agent. Dry ice sublimates at -78.5° C (-109.3° F) at atmospheric pressure. Dry ice can be used in an organic solvent as a freezing mixture for cold chemical reactions.**

***\*\*Attach additional pages as needed\*\****

**Section 1: Brief Safety Overview:**

● The Principal Investigator is responsible for training employees using the material on site. The training should include a discussion of the known and potential hazards; an explanation of the relevant policies, techniques and procedures including the proper use of personal protective equipment, emergency/spill procedures and containment equipment (engineering controls).

● Limit access to authorized users.

● Minimize the possibility of inadvertent ingestion, inhalation and direct skin or eye contact with the substance.

● Chemical has been entered in the Chemical Inventory (EHS Assistant)

● Require annual training.

**Section 2: Research Laboratory Procedures**

* **Handling Instructions**

Example: (Preparation of the stock solutions): **Proper laboratory procedure must be followed and employees must be trained to handle the material.**

* **Storage:**

**Store in insulated container which opens from the top and use Dry Ice with adequate ventilation. Do not store in tight container or confined spaces. Equipment containing Dry Ice should be kept clear of combustible material in order to minimize the risk of a fire hazard. Dry Ice should be stored in specific containers which are not above eye level. Container should be stored away from corrosives and not in hallway locations.**

***Location – Engineering controls***

[x]  Ventilation (example: Fume Hood, Canopy Hoods, etc.): **Well ventilated space**

[x]  Designated area (specify): **Laboratory space**

[ ]  Bio-Safety Cabinet

***PPE required:***

[x]  Skin/Body Protection (example: Lab Coat) **Laboratory Coat (jewelry should be removed)**

[x]  Eye protection

[x]  Face shield

[ ]  Respirator (example: N95):

[x]  Hand protection (example: Nitrile gloves): **Loose fitting thermally insulated gloves to withstand extreme cold (jewelry should be removed)**

* **Cleanup/Decontamination procedures for work area after use:**

**Dry Ice will evaporate at room temperature.**

* **Disposal Procedures**

**Unwanted Dry Ice should be removed by the distributor (example: OSU Stores). Dry Ice should not be placed in sinks to evaporate.**

**Section 3: Occupational Exposures**

* **Routes of Exposure**

Skin – **Slightly hazardous in case of eye and skin contact.**

Inhalation – **Considered an asphyxiate and is very hazardous in case of inhalation.**

Ingestion- **Slightly hazardous in case of ingestion.**

Injection- **N/A**

* **Toxicological Effects**

Acute Effects/ Precautionary Safety Measures: **Can cause frostbite in case of ingestion or any skin exposure. Can cause death is there is not enough ventilation. Vapor may cause an increase in respiration and heart rate, dizziness, drowsiness and nervous system damage.**

Chronic Effects/ Precautionary Safety Measures: **No chronic effects.**

* **Occupational Exposure Response and First Aid Measures**

Skin: **Immediately warm frostbite area with warm water not to exceed 105° F (41° C). Seek immediate medical attention.**

Eyes: **Flush eyes for at least 15 minutes while holding eyelids open. Remove contacts if they do not flush out. Seek immediate medical treatment.**

Inhalation: **Remove victim from the exposure area and take to fresh air immediately. Seek immediate medical treatment. Do not perform mouth-to-mouth resuscitation.**

Ingestion: **Do not induce vomiting. Seek immediate medical treatment.**

* **Emergency Procedure for Chemical Spills and Accidental Releases**

**Small and Large Spills:**

**Evacuate all personnel from the space, shut the door and if possible turn off the power to the room. Dry Ice will evaporate at room temperature.**

This Standard Operating Procedure must be placed in the Chemical Hygiene Plan and the SDS must be accessible. Also, all laboratory personnel must be familiar with safe handling practices (i.e., training with documentation of training) when working with these chemicals. This must be incorporated into the comprehensive chemical hygiene plan of the laboratory. If you have any questions regarding a comprehensive mandatory laboratory chemical hygiene plan please contact your Representative at Environmental Health and Safety (292-1284).For any other questions or concerns, please contact:

**PI contact information**

Name:

Primary Contact Number:

Emergency Contact Number:

P.I. Signature \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_