

**STANDARD OPERATING PROCEDURE**

**Ammonia gas**

According to the Safety Data Sheet (SDS) for **Ammonia** special precautions must be taken when working with this chemical. Below are some of the characteristics of **Ammonia** followed by recommendations for handling the chemical 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 Words:Danger**

**Pictograms: Corrosive Hazard, Acute Toxicity Hazard, and General Hazard**

Additional Classification: **cause bronchiolar and alveolar edema, coughing, and nose and throat irritation, severe injury and burns, skin burns, permanent eye damage or blindness**

Brief description of proposed chemical work:**Ammonia gas is used for synthesis of nitrogen doped TiO2**

**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): **Preparation can depend upon the laboratory practices. Proper laboratory procedure must be followed and employees must be trained to handle the material.**

* **Storage:**

**Ammonia should be kept separate from water and Use only non-corrosive storage containers. Chemical containers must be closed and labeled.**

***Location – Engineering controls***

Ventilation (example: Fume Hood, Canopy Hoods, etc): **Fume Hood**

Designated area (specify): **Laboratory space**

Bio-Safety Cabinet

***PPE required:***

Skin/Body Protection (example: Lab Coat) **Laboratory Coat**

Eye protection

Face shield

Respirator (example: N95):

Hand protection (example: Nitrile gloves): **Latex or Nitrile Gloves**

* **Cleanup/Decontamination procedures for work area after use: close the regulator and valve**
* **Disposal Procedures Ammonia gas cylinder should be kept stable**

**Section 3: Occupational Exposures**

* **Routes of Exposure**

Skin- **Very hazardous in case of eye and skin contact**

Inhalation - **Slightly hazardous in case of inhalation.**

Ingestion- **Very hazardous in case of ingestion**

Injection-  **N/A**

* **Toxicological Effects**

Acute Effects/ Precautionary Safety Measures: **Very hazardous after an acute exposure to eyes, skin or by ingestion. Severe over-exposure can result in death.**

Chronic Effects/ Precautionary Safety Measures: **Prolonged exposure can damage kidneys, liver, skin and the central nervous system.**

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

Skin: **Wash skin with disinfectant soap and cover the contaminated skin with anti-bacterial cream. Seek immediate medical treatment.**

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**

**In the event of a leak or explosion of the cylinder:**

**Make sure that the fume hood is working properly for appropriate ventilation.**

**Evaculate all personnel from space and shut the door. Post the door with the chemical spill sign from the spill skit. Call Environmental Health and Safety Emergency Response Team.**

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 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_