## Purpose

Sodium azide is an odorless, colorless crystal though the pure crystal form may be clear that is commonly used in research laboratories as a preservative. As a preservative, sodium azide usually exists in a solution at 0.1 to 2.0%. However, of greater concern is the use and storage of pure sodium azide or a solution of 10% or greater. In these forms or concentrations, the material and waste shall be considered highly acutely toxic and can be dangerously reactive when heated near its decomposition temperature. Sodium azide can also react with heavy metals to form dangerous metal azides that can be explosive; therefore, even dilute solutions (equal to or greater than 0.01%) of sodium azide must not be poured down the drain.

Sodium azide rapidly hydrolyzes when mixed with water or an acid to form hydrazoic acid, a highly toxic and explosive gas! Sodium azide is thermally unstable if heated to 275°C and may undergo violent decomposition.

Sodium azide can form explosive compounds when it comes in contact with or dries on metal surfaces. Since sodium azide will react with metal drainpipes, drain disposal is never allowed, no matter the concentration of the solution. If introduced to the wastewater treatment system in large volumes or in high concentrations, the desirable anti-bacterial characteristics of this chemical can damage the water treatment process of the city or county.

Sodium azide can also react with metal spatulas and metal lab equipment to form shock sensitive salts. Only use plastic and glass equipment when handling sodium azide and its solutions. It reacts with lead, copper, silver, and metal halides to form heavy metal azides which are explosive!

## Scope

*Identify the intended audience and /or activities where the SOP may be relevant.*

[ ] Specific laboratory procedure or experiment

* Examples: synthesis of chemiluminescent esters

[ ] Generic laboratory procedure that covers several chemicals

* Examples: distillation, chromatography

[ ] Generic use of a specific chemical or class of chemicals with similar hazards

* Examples: Organic azides, mineral acids, hydrofluoric acid

## Responsibilities

*Identify the personnel that have a primary role in the SOP and describe how their responsibilities relate to this SOP.*

|  |  |
| --- | --- |
| **Name of responsible person(s)** |  |
| **Location(s) where work is to be performed** |  |
| **Responsibilities of personnel related to SOP**  |  |

Decontamination procedures vary depending on the material being handled. The toxicity for some materials can be neutralized with other reagents. All surfaces and equipment should be wiped with the appropriate cleaning agent following dispensing or handling to prevent accumulation of Acutely Toxic chemical residue. Decontaminate vacuum pumps or other contaminated equipment before removing them from the designated area or before resuming normal laboratory work in the area.

Carefully inspect the work areas to make sure no hazardous materials remain. Clean contaminated work areas with an appropriate cleaning agent and dispose of cleaning materials as hazardous waste. Be sure all ignition sources are secured before beginning cleanup with flammable liquids.

## Procedure (step-by-step)

*Provide the steps required to perform this procedure (who, what, when, where, why, how).*

1. Step by step description of processes.
2. Provide a sequential description of work, including as much detail as possible such as designated work area(s), chemical concentrations ranges and amount used (mass, volume) and when special safety equipment is to be utilized.
3. Include temperature, pressure, and other experimental conditions if possible. Pictures and schematics are recommended for complex setups. **Highlight the steps with the highest hazards.**

## Hazard Identification & Control Measures

*Include information of how to handle a particularly hazardous substance or experimentation using a certain piece of equipment. Instructions might include recommended hazard control measures, PPE, chemical transportation, and storage.* *Describe transport, receiving and storage requirements. Include secondary containment, transport devices (carts, carriers, etc.), segregation requirements, any special temperature or atmospheric requirements, and container compatibility requirements*

**A. Potential Hazards -** Identify potential safety hazards – refer to Section 2 of the SDS.

* **Chemical Hazards (CH):**
* [x] Explosive **(depending on use)**
* [ ] Pyrophoric
* [ ] Flammable (liquid, solid, gas or aerosol)
* [ ] Self-Reactive
* [ ] Peroxide Forming
* [ ] Organic Peroxide
* [ ] Oxidizing (liquid, solid or gas)
* [x] Water-Reactive
* [x] Corrosion to Metals
* [ ] Other: Click or tap here to enter text.



* **Biological Hazards (BH):**
* [x] Carcinogen (possible)
* [ ] Sensitizer (respiratory and/or skin)
* [x] Irritant (skin and/or eye)
* [ ] Corrosive (skin and/or eye damage)
* [x] Acute Toxicity (oral, dermal and/or inhalation)
* [ ] Germ Cell Mutagen
* [ ] Reproductive Toxicity
* [ ] Target Organ Systemic Toxicity: Single Exposure
* [ ] Target Organ Systemic Toxicity: Repeated Exposure
* [ ] Radionuclides
* [ ] Other: Click or tap here to enter text.
* **Physical Hazards (PH):**
* [ ] Compressed Gases
* [ ] Cryogen
* [ ] Other: Click or tap here to enter text.
* **Electrical Hazard (EH):**
* [ ] Other: Click or tap here to enter text.

Notes (include chemicals that will be used, additional cautions, permissible exposure limits, etc.):

**Exposure:**

**FOR ANY EXPOSURE, SEEK IMMEDIATE MEDICAL ATTENTION, CALL 911.**

Eye – Redness, pain, irritation. Contact with dust or vapor may cause systemic toxicity.

Skin- Irritation, redness, blisters. May be fatal if absorbed through the skin.

Ingestion – Irritation of the digestive tract, abdominal pain, nausea, sweating, vomiting, diarrhea. May cause low blood pressure, rapid heartbeat, skin discoloration, and possible coma. May be fatal if swallowed.

Inhalation: Severe irritation of the respiratory tract with sore throat, coughing, nasal stiffness, blurred vision, shortness of breath and delayed lung edema. The vapor of hydrazoic acid symptoms include eye irritation, headache, dramatic decrease in blood pressure, weakness, pulmonary edema and collapse.

Sodium azide can cause hypotension, hypothermia, headache, shortness of breath, faintness, convulsions and death. It is toxic by all routes of exposure. The oral LD50(rat) for sodium azide is 27 mg/kg and the skin (rabbit) LD50 is 20mg/kg. The LC50 (rate) is 37 mg/mm­3. In addition, it is a mutagen, and should be treated as a possible carcinogen.

**B. Engineering controls / Administrative Controls**

[x] Fume Hood

[ ] Snorkel

[x] Glove Box (Not required but recommended when available)

[ ] Clean Room

[ ] Explosion Shielding (depending on use)

[ ] Splash Shielding

[ ] Beta Shielding

[ ] Safety Storage Cabinet

[ ] Flammable Storage Refrigerator

[ ] Other: Click or tap here to enter text.

**C. Personal Protective Equipment (PPE)**

[x] Safety Glasses (minimum)

[x] Chemically-Compatible Lab Coat

[ ] Fire-Resistant Lab Coat (dependent on the use)

[x] Gloves - specify type: Chemical specific

[ ] Acid Resistant Gloves

[ ] Acid Resistant Apron

[ ] Face shield

[ ] Other: Click or tap here to enter text.

## Waste Disposal

*List types of waste and how the waste should be handled when performing the procedure, for example, liquid biological waste, hazardous waste determination etc.*

1. **Waste Determination -** Depending on the chemical, there may be more waste characteristics. Please customize the type and characteristics of the waste appropriately for the chemical in use.

Type of waste generated by this procedure/process (*check all that apply*):

[ ] Solid [ ] Liquid

Waste hazard determination (*check all that apply to specific procedure*):

|  |  |
| --- | --- |
| *Type of Waste* | *Hazard Determination* |
| Solid  | [ ] Flammable [ ] Oxidizer [ ] Corrossive [x] Reactive [x] Toxic |
| Liquid | [ ] Flammable [ ] Oxidizer [ ] Corrossive [x] Reactive [x] Toxic |

1. Expected waste generation per experiemntal run (mass/volume): Click or tap here to enter text.
2. Disposal procedure and location of Satellite Accumulation Area: Click or tap here to enter text.

## Emergency Response

*Indicate how spills, personnel exposure/injury, and other accidents should be handled and by whom. List physical address on campus.*

**Refer to Emergency Information Sheet**

**For spills of solid materials, DO NOT dry sweep.**

**Sodium Azide requires modifications to the spill SOP.**

**Sodium Azide**: Vacuum or sweep up material and place into a suitable disposal container (non-metal). Avoid generating dusty conditions. Do not flush down the drain. Sodium azide may react with copper, lead, brass, or solder in plumbing systems to form an accumulation of the highly explosive compounds of lead azide and copper azide. Do not let this chemical enter the environment. Cover spills of sodium azide solution with absorbent material, and clean surfaces with pH adjusted water.

1. **Emergency contact numbers:**
* Principal Investigator xxx-xxx-xxxx
* Lab manager xxx-xxx-xxxx
* Poison Control Center 800-222-1222
* Emergency 911
* EHS 352-392-1591
1. **Physical address on campus:**

## References

*List resources that may be useful when performing the procedure, for example, Admin policies, standards etc.*

## Documents and attachments

*List applicable forms that are required to be completed in the SOP. Attach any documents used in support of the SOP, e.g., flowcharts, work instructions, pictures or diagrams, forms and labels*.