



Standard Operating Procedure

SODIUM AZIDE

Sodium Azide (NaN_3) is a colorless crystalline solid that is readily soluble in water. Dilute solutions are used in laboratories to preserve biological samples. It is also used as a reagent in synthetic chemistry.

Use this compound for research purposes only

Potential Hazards/Toxicity

Dilute solutions (0.1-2%) are generally used for preservation, but the handling of solutions >10% presents the greatest concern.

Health Effects:

It is highly acutely toxic by all routes of exposure.

Acute Effects:

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

Skin: Irritation, redness, blisters. **It is readily absorbed through skin and may be fatal.**

Ingestion: Irritation of the digestive tract, abdominal pain, low blood pressure, rapid heartbeat, nausea, sweating, vomiting, diarrhea. **May be fatal if swallowed.**

Inhalation: Severe irritation of the respiratory tract with sore throat, coughing, nasal stuffiness, blurred vision, shortness of breath and delayed lung edema. **May be fatal if inhaled.**

Sodium azide rapidly hydrolyzes in water to form hydrazoic acid, which can be can cause serious effects if inhaled, including eye irritation, headache, dramatic decrease in blood pressure, weakness, pulmonary edema and collapse.

Chronic Effects

Chronic exposure to sodium azide may result in liver and kidney damage. Repeated exposure may cause damage to the spleen. Laboratory studies have shown mutagenic effects, development of tumors in animals, and blood effects.

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Physical Hazards:

Sodium azide can form explosive compounds when it comes into contact with or dries on metal surfaces, this includes metal spatulas or other metal lab equipment. Even dilute solutions of sodium azide must not be poured down the drain since it may also react with metal pipes. Heating sodium azide to temperatures $\geq 275^\circ\text{C}$ may cause it to undergo violent decomposition.

Users must familiarize themselves with the specific hazards of the compounds they are working with, which can be found on the chemical's Safety Data Sheet (SDS). SDSs are available through SDS link on the Yale EHS webpage (ehs.yale.edu).

Personal Protective Equipment (PPE)

The University's Personal Protective Equipment Policy can be found on the Yale EHS webpage (ehs.yale.edu)

Eye Protection

Safety glasses must be worn. When there is the potential for splashes, goggles and a faceshield must be worn.

Hand Protection

Exam-style nitrile gloves must be worn. Double exam-style nitrile gloves, or a utility grade nitrile glove over an exam style, must be worn when handling it in concentrations >5%.

Skin and Body Protection

Long pants or clothing that covers the body to the ankles and closed-toe solid top shoes must be worn when handling sodium azide. Lab coats must be worn. If working with larger amounts where a splash to the body/arms is possible, then additional body protection should be worn, i.e., chemical resistant apron, oversleeves, etc.

Engineering Controls

Fume hoods, or other locally exhausted ventilation, must be used when handling sodium azide in both solution and powdered form.

Decontamination

Sodium azide is a water-reactive compound. After working with sodium azide, decontaminate work surfaces with 70% ethanol.

Storage

- Store in a cabinet or drawer; do not store sodium azide on open shelves or counters.
- Do not store on metal shelves.
- Store in tightly closed containers in a cool, well-ventilated area away from heat, air, light and moisture.
- Store away from metals, acids, carbon disulfide, bromine, chromyl chloride, sulfuric acid, nitric acid, hydrazine and dimethyl sulfate.

Emergency Procedures

Fire Extinguishers

An ABC dry powder extinguisher is appropriate if there is a fire involving sodium azide.

Eyewash/Safety Showers

An ANSI approved eyewash station that can provide quick drenching or flushing of the eyes must be immediately available within 10 seconds travel time for emergency use. An ANSI approved safety drench shower must also be available within 10 seconds travel time from where sodium azide is used. Ensure the locations of the eyewashes and safety showers, and how to activate them, are known prior to an emergency.

First Aid Procedures

If inhaled

Remove to fresh air. Call 911 for immediate medical attention.

In case of skin contact

Go to the nearest emergency shower if contaminated. Yell for assistance and rinse for 15 minutes, removing all articles of clothing to ensure contamination is completely removed. If contact was with

concentrated reagent, call 911 for immediate medical attention. If contact was with dilute solution, follow up with Acute Care or Employee Health.

In case of eye contact

Go to the nearest emergency eyewash. Yell for assistance and rinse for 15 minutes. If contact was with concentrated solution, call 911 for immediate medical attention. If contact was with dilute solution, follow up with Acute Care or Employee Health.

Spills

Small Spill

If a small spill occurs inside a fume hood, lab personnel should be able to safely clean it up by following this spill cleanup procedures:

- Alert people in immediate area of spill
- Wear personal protective equipment, including utility grade nitrile gloves
- Solution: Confine spill to small area with absorbent material (pads, vermiculite) and clean surfaces with pH adjusted water (pH>9)
- Solid/crystals: Sweep up with dustpan/broom and clean surfaces with pH adjusted water (pH>9)
- Collect residue, place in container, label container, and dispose of as hazardous waste

Larger Spill or Spill Outside a Fume Hood

- Call EHS for emergency assistance (203-785-3555)
- Evacuate the spill area
- Post someone or mark-off the hazardous area with tape and warning signs to keep other people from entering
- Stay nearby until emergency personnel arrive and provide them with information on the chemicals involved

Waste Disposal

Sodium azide solutions/stock materials must be collected as hazardous waste. Sodium azide should never be disposed of down the drain. All items contaminated with acutely toxic (P-Listed) compounds must be collected as hazardous waste. This includes weigh boats, pipette tips, kimwipes, and other similar items that have come into contact with sodium azide

Lab Specific Protocol/Procedure: