

Sodium Azide

Principal Investigator (PI) Approval is Required Prior to Performing this Procedure

Description

This standard operating procedure outlines the handling and use of sodium azide. Review this document and supply the information required in order to make it specific to your laboratory. In accordance with this document, laboratories should use appropriate controls, personal protective equipment, and disposal techniques when handling sodium azide.

Sodium azide (NaN_3) is a colorless crystalline solid and is readily soluble in water. Sodium azide is a common preservative of samples and stock solutions in laboratories and a useful reagent in synthetic work.

Potential Hazards

Consult the safety data sheet (SDS) and these other resources:

- [Laboratory Chemical Safety Summary: Sodium Azide](#), *Prudent Practices in the Laboratory* (The National Academies Press).
- [Facts About Sodium Azide](#), Centers for Disease Control and Prevention

Be aware of these specific hazards:

- Sodium azide is extremely toxic (LD50 oral [rat] 27mg/kg). Ingesting a small amount can be lethal.
- On contact with water or acid, sodium azide reacts to form a toxic gas (hydrazoic acid) with a pungent odor. However, the odor may not be strong enough to give sufficient warning. Store sodium azide away from acids.
- MIOSHA and the American Conference of Governmental Industrial Hygienists recommends a ceiling limit of 0.3 mg/m³ for sodium azide.
- When heated to its decomposition temperature of ~275°C, sodium azide may undergo violent decomposition. Store and use sodium azide away from heat.
- Sodium azide reacts with heavy metals and their salts to form heavy metal azides, which are shock-sensitive explosives. Do not store on metal shelves or use metal items to handle sodium azide (i.e., spatulas). Contact with metal shelves, containers, and utensils can result in formation of heavy metal azides and the risk of explosion.
- Sodium azide reacts violently with nitric acid, bromine, carbon disulfide, dimethylsulfate, and several heavy metals including copper and lead.

Engineering Controls

If hydrazoic acid or aerosols may be produced, sodium azide (and sodium azide solutions) must be handled in a chemical fume hood, exhausted biological safety cabinet with negative pressure ductwork, or other exhausted enclosure. Aerosols may be produced during any open handling of dry powder, and during open or pressurized manipulations of solutions.

Work Practice Controls

- Use a less dangerous product than sodium azide if possible, or purchase in dilute solution.
- Set up a designated area for work with sodium azide and suspensions thereof, and label it.
- If weighing dry powders and the balance cannot be located in a fume hood or BSC, tare a container then add the powdered sodium azide to the container in a hood and seal the container before returning to the balance to weigh the powder.
- Change gloves regularly (at least every two hours) and wash hands at the time of the glove change.
- Do not use a HEPA vacuum for cleaning up sodium azide – sodium azide could react with metal inside the vacuum.
- Keep containers closed as much as possible.
- Once work with sodium azide is complete, wipe down the work area with a soap and water solution.

Personal Protective Equipment (PPE)

- Two pairs of standard nitrile laboratory gloves and a fully buttoned lab coat, long pants, and close-toe shoes must be worn when handling sodium azide.
- If splashes may occur, wear goggles and a face shield. Otherwise, wear standard laboratory safety glasses.
- In cases where the arms or torso may be exposed to liquid suspensions or dry particles, wear Tyvek sleeves and/or gowns (or other air-tight non-woven textile).

Transportation and Storage

- Dry powders must be in sealed shatter-resistant containers during transportation. If the container is not shatter-resistant, use a secondary container.
- Keep away from heat and open flame.
- Store in a cool, dry area.
- Keep sodium azide powder and strong solutions away from benzoyl chloride, potassium hydroxide, bromine, carbon disulfide, chromyl chloride, copper, dibromalonnitrile, dimethyl sulfate, lead, barium carbonate, acids (especially sulfuric and nitric), and water.

Waste Disposal

Never flush sodium azide (solid or concentrated solution) down the drain — the azide can react with lead or copper in the drain lines and explode.

Because most spent, unused and expired chemicals/materials are considered hazardous wastes, they must be properly disposed of. ***Do not dispose of chemical wastes by dumping them down a sink, flushing in a toilet or discarding in regular trash containers.*** Refer to EH&S's [Hazardous Waste webpage](#) for more information.

Exposures/Unintended Contact



the employee/student is in need of emergency medical attention, call 911 immediat



For an actual chemical exposure/injury,

- Flush exposed eyes or skin with water for at least 15 minutes, then seek medical attention (see below).
- For inhalation exposure, remove all persons from the contaminated area and seek medical attention.

Spill Procedure

For cleaning up a small spill of sodium azide, do not use metal instruments. Wipe up solutions with chemical absorbent pads. Cover solids with sand, sweep up, and place in a non-metal container. Once spill has been completely absorbed, wipe the area down at least two times using a soap and water solution. Refer to EH&S's [Hazardous Waste webpage](#) for more information.

Training of personnel

All personnel shall read and fully adhere to this SOP when handling sodium azide.