

## Lab-Specific Standard Operating Procedure (LSOP) - Sodium Azide

Principal Investigator(PI):


Building:

Lab(s) Covered by LSOP:

Department:

Lab Phone Number(s):

### SECTION 1. OSHA's GLOBALLY HARMONIZED SYSTEM (GHS)-SDS INFORMATION

Chemical	GHS Pictogram	Definition
Sodium Azide		<p><b>Sodium Azide:</b> NaN<sub>3</sub>, A colorless &amp; odorless white solid, CAS# 26628-22-8, Has a Density of 1.846 g/cm<sup>3</sup>, Has a Molar Mass of 65.0099 g/mol, Has a Melting Point of 275 °C (527 °F; 548 K) with violent decomposition, and is considered highly toxic by LD and LC-50. Sodium Azide is a useful probe reagent and a preservative. In hospitals and laboratories, it is a biocide; it is especially important in bulk reagents and stock solutions which may otherwise support bacterial growth where the Sodium Azide acts as a bacteriostatic by inhibiting cytochrome oxidase in gram-negative bacteria; gram-positive</p>
<b>Signal Word</b>		
<b>Danger</b>		
<b>GHS Hazard Classification</b>		
<b>Note: Under the GHS System (1-4); (1 is the most and 4 is the least)</b>		
Acute toxicity, Oral (Category 2)		
Acute toxicity, Dermal (Category 1)		
Specific target organ toxicity - repeated exposure, Oral (Category 2), Brain		
Acute aquatic toxicity (Category 1)		
Chronic aquatic toxicity (Category 1)		
<b>GHS Hazard Statements</b>		
<b>Fatal</b> if swallowed or in contact with skin		
May cause damage to organs (Brain) through prolonged or repeated exposure if swallowed		
Very toxic to aquatic life with long lasting effects		

## GHS Precautionary Statements

### Fatal if swallowed or in contact with skin

Do not breathe dust/ fume/ gas/ mist/ vapors/ spray

Do not get in eyes, on skin, or on clothing

Wash skin thoroughly after handling

Do not eat, drink or smoke when using this product

Avoid release to the environment

Wear protective gloves/ protective clothing/ eye protection/ face protection

IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. Rinse mouth

IF ON SKIN: Gently wash with plenty of soap and water. Immediately call a POISON CENTER or doctor/ physician

Get medical advice/ attention if you feel unwell

Take off contaminated clothing and wash before reuse

Collect spillage. Store locked up

### SECTION 2. LIST AZIDE CHEMICALS USED IN THE LAB (*Attach or insert more lines as necessary*)

Chemical Name	Additional Hazards
<b>Sodium Azide</b>	Contact with acids liberates very toxic gas
	If Sodium Azide contacts acidic solutions it yields <a href="#">hydrazoic acid</a> , which is also extremely toxic and potentially explosive. Aqueous solutions of Sodium Azide contain minute amounts of <a href="#">hydrogen azide</a>
	Sodium Azide may react with lead and copper plumbing to form highly explosive metal azides
	Rapidly absorbs through skin and can be fatal
	The toxicity of this compound is comparable to that of soluble alkali cyanides and the lethal dose for an adult human is about 0.7 grams
	Incompatible with Halogenated hydrocarbon, Metals, Acids, Acid chlorides, Hydrazine, Dimethyl sulfate, Inorganic acid chlorides
	USA NIOSH Recommended Exposure Limit & OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000 is 0.100000 ppm (C)
	Is an EPA Hazardous Listed Waste upon disposal and designated with waste code; (P-105), Meaning RCRA empty Sodium Azide bottles and items contaminated with residues, most likely through batching, will have to collect as Listed/Acute Hazardous Wastes.
	EPA Satellite Accumulation Area (SAA) limits for Acutely Hazardous/P-Listed Wastes are set at 1 quart for liquid and 1 kilogram/2.2 pounds for solids.

### SECTION 3. ADMINISTRATIVE CONTROLS

1.	Lab-specific safety training must be provided by the principal investigator (PI) or other qualified personnel to all researchers working with Sodium Azide.
2.	Documentation of training is required.
3.	Read the Safety Data Sheet ( <b>SDS</b> ) for Sodium Azide prior to use.
4.	Whenever possible, find <b>safer substitutes or reduce</b> the quantities of Sodium Azide or purchase pre-made preservative level azide versus batching from Reagent grade powder.

5.	Researchers must <b>not work alone</b> with Sodium Azide. Please note that UCONN Health/Storrs has a <b>Working Alone Policy, found at <a href="http://content.research.uconn.edu/pdf/uch/rcs/ehs/policy-workingalone2017.pdf">http://content.research.uconn.edu/pdf/uch/rcs/ehs/policy-workingalone2017.pdf</a></b>
6.	Experiments should be performed <b>during normal business hours</b> (e.g.) 8:00 am-5:00 pm Mon-Fri) if possible.
7.	Multiple transfers of small volumes/quantities of Sodium Azide are preferred over a single transfer of larger volumes/quantities.
<b>SECTION 4. ENGINEERING CONTROLS</b>	
1.	Chemical fume hoods must be running at over 90 linear feet/minute and tested by EHS within the last year.
2.	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value.
3.	Ensure that eyewash stations and safety showers are proximal to the workstation location and tested accordingly.
4.	EH&S certifies flow rates of fume hoods for UCONN Health, contact EH&S at 860-679-2723 for re-test.
5.	If the hood is not working properly, contact Facilities to repair the hood at 860-679-2125.
<b>SECTION 5. WORK PRACTICES</b>	
1.	Only chemicals involved in the experiment should be present in the fume hood or glovebox. All non-essential chemicals and materials must be removed. <b>Note</b> -chemicals and wastes may not store permanently in the Fume Hoods.
2.	Precautions for safe handling are to avoid contact with incompatibles, acids, skin, eyes, inhalation, and metals.
3.	Precautions for safe handling are to use in fume chemical fume hoods only, and with the correct PPE being worn.
4.	Great care must be taken to handle Sodium Azide in a manner that contamination with metals doesn't occur, as the formation of metal azides can present an explosion hazard when formed crystals are left to dry.
5.	Sodium Azide must never be drain disposed, due to build-up of metal azides in metal plumbing lines and the toxicity to aquatic life.
6.	Containers which are opened must be carefully resealed and kept upright to prevent leakage
<b>SECTION 6. PERSONAL PROTECTIVE EQUIPMENT</b>	
1.	The PI must perform a Workplace Hazard Assessment ( <b>WHA</b> ) form for Laboratories at, <a href="http://research.uchc.edu/wp-content/uploads/sites/1137/2015/09/workplace_hazard_assessment.pdf">http://research.uchc.edu/wp-content/uploads/sites/1137/2015/09/workplace_hazard_assessment.pdf</a>
2.	The Occupational Safety and Health Administration (OSHA) requires employers to conduct inspections of all workplaces or tasks to determine if hazards are present that would require the use of Personal Protective Equipment (PPE). The <b>Workplace Hazard Assessment Form</b> (WHA) has been designed to help UConn supervisory personnel choose appropriate PPE for their employees and provide the written certification required to comply with the OSHA regulation ( <a href="#">29 CFR 1910.132 Subpart I</a> ).
3.	Eye/face protection, face shield and safety glasses. Use equipment for eye protection tested and approved under appropriate government standards such as <b>NIOSH (US) or ANSI</b> .
4.	For skin, protection handle with gloves as per the recommendation of the chemical manufacturer and listed on the SDS. NIOSH also provides recommended protection based on material and thickness and protection rates of degradation and permeability.
5.	Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product Wash and dry hands.
6.	Dispose of contaminated gloves, PPE, Lab material as (P-Listed) Sodium Azide "Hazardous Waste," after use in accordance with applicable laws and good laboratory practices. <b>The contaminated waste should be placed in a sealed Zip-lock bag, with a Hazardous Waste Tag adhered to it and wording stating, "Sodium Azide Contaminated Debris."</b> Then place an EH&S waste request for pick-up/removal.
7.	<b>Full contact and or Splash contact</b> Material: Nitrile rubber Minimum layer thickness: <b>0.11 mm</b> Sigma-Aldrich - 13412 Page 5 of 9 Break through time: 480 min Material tested: Dermatril® (KCL 740 / Aldrich Z677272, Size M)

8.	Closed-toed footwear, which covers the entire foot, must be worn when working with Sodium Azide. Leather footwear is preferable.
9.	The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.
10.	An eyewash and safety shower must be in the immediate work area where Sodium Azide is used.
11.	Respirators are not approved for wearing unless medical clearance, fit test, respirator selection and training is provided and at no cost to the employee. EH&S recommends only performing work in fume hoods.
<b>SECTION 7. STORAGE</b>	
1.	Conditions for safe storage, including any incompatibilities are to keep container tightly closed in a dry and well-ventilated place.
2.	Sodium Azide should be stored in a secure manner, and recommended by manufacturer's & EH&S to be physically locked- up for safety purposes.
3.	Store Sodium Azide per SDS and Manufacturer safe recommendations.
4.	Do not store Sodium Azide with acids, flammable materials, oxidizers or near water sources. Incompatible with Halogenated hydrocarbon, Metals, Acids, Acid chlorides, Hydrazine, Dimethyl sulfate, Inorganic acid chlorides
5.	Great care must be taken to store Sodium Azide in a manner that contamination with metals doesn't occur, as the formation of metal azides can present an explosion hazard when formed crystals are left to dry.
<b>SECTION 8. SPILLS, ACCIDENTS &amp; EMERGENCY PROCEDURES</b>	
1.	Call <b>911 or 7777</b> from landline if <b>Life Threatening</b> and call EH&S at <b>860-679-2723 for Non-Life Threatening Spill</b> Coordination efforts.
2.	Evacuate the laboratory and inform others in the immediate area to leave the work area. Evacuate the laboratory calmly yet safely, and rally at the <b>Emergency Assembly Area (EAA)</b> as designated by the Fire Department
3.	The <b>(EAA)</b> is a pre-determined safe zone for employees to meet during an emergency.
4.	Upon evacuation, also try to <b>minimize damage; isolate/contain</b> if able. (e.g.) open hoods to accelerate dissipation in air, hit HVAC purge button to increase laboratory air changes, disconnect electrical sources etc.
5.	Upon Evacuation, close door(s) to lab and post a <b>"NO ENTRY"</b> sign(s) or other warning information on the door.
6.	The <b>Emergency Evacuation Attendants (EEA) are those who have been assigned</b> take roll call of employees and report to the <b>Emergency Evacuation Coordinator (EEC)</b>
7.	No one shall be permitted to leave the <b>Emergency Assembly Area (EAA)</b> until the scene has been determined safe for re-entry by the On-Scene <b>Emergency Coordinator (EC)</b> -Senior Fire Department Official.
8.	<b>Do not re-enter</b> the lab/area until instructed to do so by the On-Scene <b>Emergency Coordinator (EC)</b> -Senior Fire Department Official.
9.	Should the <b>Emergency Assembly Area (EAA)</b> be compromised, <b>evacuees will be instructed by Emergency Evacuation Attendants (EEA's) or the Emergency Evacuation Coordinator (EEC) to re-locate to a secondary Emergency Assembly Area (SEAA)</b>
10.	EH&S recommends that individual labs discuss emergency response and readiness at their laboratory meetings and practice drill. EH&S can aid in this effort along with Public Safety.
11.	Report Spills, accidents which are also deemed non-life threatening or non-emergency situations to your respective PI/Supervisor and EH&S.
<b>SECTION 9. FIRST AID PROCEDURES</b>	
<b>First Aid- Eyes</b>	<ol style="list-style-type: none"> <li>1. Remove contact lenses (if applicable)</li> <li>2. Forcibly hold eyelids open and flush eyes under eyewash for 15 minutes</li> <li>3. If pain persists after 15 minutes, dial <b>911</b></li> <li>4. Keep flushing eyes until emergency personnel arrives</li> <li>5. Report incident to PI/Supervisor and EHS.</li> </ol>

<b>First Aid- Skin</b>	<ol style="list-style-type: none"> <li>1. Remove contaminated clothing (if applicable)</li> <li>2. Flush affected area(s) under safety shower for 15 minutes</li> <li>3. If pain persists after 15 minutes, dial <b>911</b></li> <li>4. Keep rinsing affected area until emergency personnel arrives</li> <li>5. Report incident to PI/Supervisor and EHS.</li> </ol>
<b>First Aid- Inhalation</b>	<ol style="list-style-type: none"> <li>1. Move to fresh air</li> <li>2. Dial <b>911</b></li> <li>3. Report incident to PI/Supervisor and EHS.</li> </ol>

**SECTION 10. SODIUM AZIDE WASTE MANAGEMENT (SPECIFIC)**

1.	Is an EPA Hazardous Listed Waste upon disposal and designated with waste code; (P-105), Meaning RCRA empty Sodium Azide bottles and items contaminated with residues, most likely through batching, will have to collect as Listed/Acute Hazardous Wastes.
2.	Sodium Azide that is expired and or contaminated and/or cannot be used for its intended purpose, or any unused or unwanted Sodium Azide must be disposed of as Hazardous Waste.
3.	Sodium Azide solutions must never be allowed to evaporate in the fume hood as empty with residue or filled containers, as this is a form of treatment that requires a permit. Containers with residues of Sodium Azide or reagent grade Sodium Azide, must never be left open to the atmosphere.
4.	A Hazardous Waste tag must be adhered to the waste Sodium Azide and properly filled out. Please ensure that the Sodium Azide container and SAA tray are void of exterior residues, are compatible with the collection container, that the contents themselves are compatible, is under the control of the generator of Sodium Azide and it is maintained in the appropriate SAA-(not the fume hood).

**SECTION 11. HAZARDOUS WASTE MANAGEMENT (GENERAL)**

1.	All hazardous wastes must be labeled with "Hazardous Waste" stickers or tags, use full chemical names to describe the waste (i.e. no chemical abbreviations or symbols), have 100% of the constituents by volume identified and be stored in containers with tight-fitting caps or lids, and be segregated by chemical compatibility.
2.	Hazardous wastes must be stored at or near a green "Satellite Accumulation Area" sign prior to disposal by EHS.
3.	Hazardous wastes must accumulate under the control of the generator, with a container maintained in good condition, free of exterior residues on container or in the spill tray. All spills and residues must be immediately cleaned up.
4.	Hazardous wastes must be transferred within a chemical fume hood but then be removed for temporary storage with the generator's respective (SAA). When chemical waste is being transferred is the only time that it may remain open. Closed, means that no liquid will spill from a waste collection container, should the container be knocked over/inverted.
5.	EPA (P-Listed) Hazardous wastes regardless of being RCRA empty or not must be collected as Hazardous wastes.

**SECTION 12. SPECIFIC PROCEDURE (left blank intentionally; please see & follow instructions)**

***(Document the Experiment Information with regard to use of Sodium Azide, too include the procedures for disposal of the waste and the selection and application of the correct PPE)***

**Instructions As Follows:** \_\_\_\_\_

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**SECTION 13. APPROVAL**

I have reviewed, understand and agree to follow this LSOP regarding Sodium Azide liquids and solids. Failure to follow the LSOP and lab-specific training guidelines for research with Sodium Azide is a violation of the [University Health & Safety Policy](#) and [University Code of Conduct](#). Further approval from the PI is required if any of the following events occur:

- A change in the agreed-upon experimental set-up is planned
- Signs of a failure in safety design or equipment are observed
- Signs or symptoms of a chemical exposure to any personnel are observed
- Unexpected and/or potentially dangerous experimental results occur (e.g., fire, uncontrolled buildup of heat and/or pressure, etc.)

Researcher Signature	Date	Trainer Signature	Training Date

**SECTION 14. PRINCIPAL INVESTIGATOR CERTIFICATION**

*I approve the contents of the lab-specific standard operating procedure listed above:*

**PI Signature:**

**Date:**

**A HARD OR ELECTRONIC COPY OF EACH LAB-SPECIFIC STANDARD OPERATING PROCEDURE MUST BE READILY AVAILABLE IN THE LAB FOR COMPLIANCE PURPOSES.**