Standard Operating Procedure

Lithium / Potassium Azide

*This is an SOP template and is not complete until: 1) lab specific information is entered into the box below 2) lab specific protocol/procedure is added to the protocol/procedure section and
3) SOP has been signed and dated by the PI and relevant lab personnel.*

 Print a copy and insert into your
*Laboratory Safety Manual* and *Chemical Hygiene Plan*.
Refer to instructions for assistance.

|  |  |
| --- | --- |
| **Department:** | Click here to enter text. |
| **Date SOP was written:** | Click here to enter a date. |
| **Date SOP was approved by PI/lab supervisor:** | Click here to enter a date. |
| **Principal Investigator:** | Click here to enter text. |
| **Internal Lab Safety Coordinator/Lab Manager:** | Click here to enter text. |
| **Lab Phone:** | Click here to enter text. |
| **Office Phone:** | Click here to enter text. |
| **Emergency Contact:** | Click here to enter text. |
| *(Name and Phone Number)* |
| **Location(s) covered by this SOP:** | Click here to enter text. |
| *(Building/Room Number)* |

**Type of SOP:** ☐ Process ☒Hazardous Chemical ☐ Hazardous Class

**Purpose:**

Lithium azide is the chemical compound having the formula LiN3. Lithium azide is the [lithium](http://en.wikipedia.org/wiki/Lithium) salt of [hydrazoic acid](http://en.wikipedia.org/wiki/Hydrazoic_acid). It is an unstable and toxic compound that decomposes into [lithium](http://en.wikipedia.org/wiki/Lithium) and [nitrogen](http://en.wikipedia.org/wiki/Nitrogen) when heated.

Potassium azide is the chemical compound having the formula KN3. It is the [potassium](http://en.wikipedia.org/wiki/Potassium) [salt](http://en.wikipedia.org/wiki/Salt_%28chemistry%29) of [hydrazoic acid](http://en.wikipedia.org/wiki/Hydrazoic_acid), and crystallizes in a tetragonal structure. Upon heating or irradiation with ultraviolet light, it decomposes into potassium metal and [nitrogen](http://en.wikipedia.org/wiki/Nitrogen) gas. Unlike heavy-metal [azides](http://en.wikipedia.org/wiki/Azide), it is not sensitive to shock, but may explode if heated rapidly.

These are of practical importance as explosives, as industrial chemicals, and as possibly useful photographic materials at low temperature. It is the subtle difference in bonding in the azides that leads to large differences in stability and decomposition behavior. These chemicals also have a use in commercial products as well. In aerospace they are used as ingredients for propellants. In the manufacturing sector they are used to make fungicides and herbicides. And, in the automotive industry, they are used as a fuel in airbags.

**Physical & Chemical Properties/Definition of Chemical Group**

CAS#: LiN3 🡪 19597-69-4

 KN3 🡪 [20762-60-1](http://www.commonchemistry.org/ChemicalDetail.aspx?ref=20762-60-1)

Class: **Toxic and explosive**

Molecular formula: Lithium azide 🡪 LiN3

 Potassium azide 🡪 KN3

Boiling Point:Not available

Melting Point: Lithium azide 🡪 103 °C

Potassium azide 🡪 350 °C (in vacuum)

Decomposition Temperature: Not available

 LiN3 KN3

  

**Potential Hazards/Toxicity**

**EMERGENCY OVERVIEW:** Toxic and explosive. Hygroscopic monoclinic crystals.

**Potential Health Effects:**

**Eye:** May cause eye irritation.

**Skin:** May cause skin irritation

**Ingestion:** Poison by ingestion

**Inhalation:** May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

**Personal Protective Equipment (PPE)**

**Eyes:** Wear chemical splash goggles

**Skin:** Viton gloves must be worn while handling

**Clothing:** Wear long pants, closed toed shoes and a lab coat

**Respirators:** A NIOSH/OSHA approved air purifying dust or mist respirator

Lab personnel intending to use/wear a respirator mask must be trained and fit-tested by ORS and should contact occhealt@uga.edu. This is a UGA requirement described in more detail in the [UGA Respiratory Protection Plan](https://esd.uga.edu/sites/default/files/respiratoryprotection.pdf) and supported by the [Office of Research Occupational Health and Safety Program](https://research.uga.edu/ohsp/).

**Engineering Controls:** Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. In other words, work with this chemical in a fume hood.

**First Aid Procedures**

**Eyes:** Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

**Skin:** Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

**Ingestion:** Get medical aid immediately. Wash mouth out with water.

**Inhalation:** Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

**Notes to Physician:** Treat symptomatically and supportively.

**Special Handling and Storage Requirements**

**Handling:** Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Provide appropriate exhaust ventilation at places where dust is formed. Avoid shock and friction. Keep away from sources of ignition - No smoking.

**Storage:** Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances, heat, sparks, flames or other ignition sources.

**Spill and Accident Procedure**

**Chemical Spill Dial 911**

**24-7 On-Call Response to Research, Environment, Health or Safety Concerns Dial 2-5561 from a campus phone or 706-542-5561 from a non-campus line.**

**Spill** – Follow the procedures set out in the [UGA Chemical and Laboratory Safety Manual.](http://research.uga.edu/docs/units/safety/manuals/Chemical-Laboratory-Safety-Manual.pdf)

[If there are any chemical-specific protocols for responding to a spill, insert them here or mark “none”:]

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# **Medical Emergency Dial 911**

**Life Threatening Emergency, After Hours, Weekends And Holidays** – Dial **911** or the emergency phone numbers listed at the beginning of the UGA Chemical and Laboratory Safety Manual

*Note: All incidents that result in an injury or property damage must be reported to ORS / ESD using a University Incident/Accident Report.*

**Non-Life Threatening Emergency** – Follow the instructions in the UGA Chemical and Laboratory Safety Manual.

*Note: All incidents that result in an injury or property damage must be reported to ORS / ESD using a University Incident/Accident Report.*

**Decontamination/Waste Disposal Procedure**

**For general hazardous waste disposal procedures, see Appendix H of the UGA Chemical and Laboratory Safety Manual.**

**Chemical Specific Procedures: [to be inserted or marked as “none”]**

**Safety Data Sheet (SDS) Location**

UGA personnel can access Online SDS through a link in the upper left corner of the ESD home page (<https://esd.uga.edu>) and logging in by using their UGA email user name and password.

**Protocol/Procedure**

*(Add specific description of procedure.)*

**Note:** Any deviation from this SOP requires written approval from PI.

**Documentation of Training** *(signature of all users is required)*

* Prior to conducting any work with Lithium / Potassium Azide, designated personnel must provide training to his/her laboratory personnel specific to the hazards involved in working with this substance, work area decontamination, and emergency procedures.
* The Principal Investigator must provide his/her laboratory personnel with a copy of this SOP and access to the SDS provided by the manufacturer.
* The Principal Investigator must ensure that his/her laboratory personnel have attended appropriate laboratory safety training or refresher training within the last 12 months.

**Principal Investigator SOP Approval**

Print name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Signature\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Approval Date:

I have read and understand the content of this SOP:

|  |  |  |
| --- | --- | --- |
| **Name** | **Signature** | **Date** |
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