Standard Operating Procedure

Lithium Hydride

*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 [x] Hazardous Chemical [x]  Hazardous Class

**Purpose**

Lithium hydride (LiH) is air reactive (high moisture environments) and a highly water reactive chemical. LiH reacts explosively with water/moisture and yields hydrogen gas and lithium hydroxide (LiOH), which is corrosive. LiH is used to produce reagents useful in organic synthesis, such as lithium aluminum hydride (LiAlH4) and lithium borohydride (LiBH4). It has also been used as a coolant and shielding in nuclear reactors.

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

CAS#: 7580-67-8

Class: **Air and water reactive**

Molecular Formula: LiH

Form (physical state): Powder

 Color: Light grey

Boiling point: N/A

**Potential Hazards/Toxicity**

If inhaled, material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract. Causes skin and eye burns. Toxic if swallowed.

**Personal Protective Equipment (PPE)**

**Respirator Protection**

Where risk assessment shows air-purifying respirators are appropriate, use a full-face particle respirator (N100) with cartridges as a backup to engineering controls.

Respirators should be used only under any of the following circumstances:

* As a last line of defense (i.e., after engineering and administrative controls have been exhausted).
* When Permissible Exposure Limit (PEL) has exceeded or when there is a possibility that PEL will be exceeded.
* Regulations require the use of a respirator.
* An employer requires the use of a respirator.
* There is potential for harmful exposure due to an atmospheric contaminant (in the absence of PEL)
* As PPE in the event of a chemical spill clean-up process

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/).

**Hand Protection**

Type of gloves recommended for Lithium Hydride: *Nitrile or Neoprene*

NOTE: Consult with your preferred glove manufacturer to ensure that the gloves you plan on using are compatible with Lithium Hydride

Refer to glove selection chart from the links below:

<http://www.ansellpro.com/download/Ansell_8thEditionChemicalResistanceGuide.pdf>

OR

<http://www.allsafetyproducts.biz/page/74172>

OR

<http://www.showabestglove.com/site/default.aspx>

OR

<http://www.mapaglove.com/>

**Eye Protection**

ANSI approved safety glasses or goggles.

**Skin and Body Protection**

Fire/flame resistant lab coat (100% cotton based)

Cotton based clothing/attire.

Full length pants or equivalent

Close toed shoes

**Hygiene Measures**

Wash thoroughly after handling. Wash hands before eating. Remove contaminated clothing and wash before reuse.

**Engineering Controls**

* **Glove Box** must be used to handle Lithium hydride.
* Must be stored and used under inert atmosphere/conditions.

**First Aid Procedures**

**If inhaled**

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

**In case of skin contact**

Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water for at least 15 minutes. Take victim immediately to hospital. Consult a physician.

**In case of eye contact**

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician. Continue rinsing eyes during transport to hospital.

**If swallowed**

Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

**Special Handling and Storage Requirements**

**Conditions of flammability**

May burn in presence of air, or emit a flammable gas in the presence of water or water vapor/moisture. Keep away from heat/sparks/open flame/hot surface/air/water.

**Suitable extinguishing media**

Dry powder and Class D fire extinguisher

**DO NOT use water**

**Special protective equipment for fire-fighters**

Wear Self-Contained Breathing Apparatus (SCBA) for fire-fighting if necessary.

**Precautions for safe handling**

* Avoid contact with skin and eyes.
* Avoid formation of Lithium hydride dust and aerosols
* Provide appropriate exhaust ventilation at places where dust is formed.
* Keep away from sources of ignition – Open flames/Bunsen Burner

**Conditions for safe storage**

* Keep Lithium Hydride container tightly closed in a dry and well-ventilated place.
* Hazard communication label on the container must read Air & *Water Reactive* W
* Never allow product to get in contact with moisture/water or water based compounds during storage. **Note:** Do not leave the container on the bench top even momentarily.
* Do not leave the container near the lab sink, emergency eyewash and safety shower.
* Do not store in humid air/moisture.
* Handle and store under inert gas (Noble gases such as Nitrogen, Argon etc.)
* Always handle inside a **glove box**.
* Keep in a dry place (such as a desiccator or a dry box or glove box).

**Materials to avoid**

* Strong oxidizing agents, acids and alcohols.
* Reacts violently with water

**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”]**

**NOTE:** All Lithium hydride waste containers must be tightly closed at all times and must be stored under inert atmosphere.

**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 lab specific Protocol/Procedure here)**

Click here to enter text.

**NOTE**

Any deviation from this SOP requires approval from PI.

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

* Prior to conducting any work with lithium hydride, 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:

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