**Standard Operating Procedures**

Laboratory Specific

**Chemical:** **Lithium hydroxide**

Please fill out the form completely.  Print a copy and insert into your

 *Laboratory Safety Manual and Chemical Hygiene Plan*.

Refer to instructions for assistance.

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Department:\_­­­­­­­­­­­­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_                     Date when SOP was written: \_\_\_\_\_\_\_\_\_

Date when SOP was approved by the lab supervisor: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Principal Investigator: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Internal Laboratory Safety Coordinator/Lab Manager: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Laboratory Phone: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Office Phone: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Emergency Contact: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

                                    *(Name and Phone Number)*

Location(s) covered by this SOP: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

                                                *(Building/Room Number)*

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

**Purpose**

Lithium hydroxide is an inorganic compound with the formula LiOH. It is a white hygroscopic crystalline material. It is soluble in water and slightly soluble in ethanol. It is available commercially in anhydrous form and as the monohydrate (LiOH.H2O), both of which are strong bases. Lithium hydroxide is mainly consumed for the production of lithium greases. It is used as a heat transfer medium and as a storage-battery electrolyte. It is also used in ceramics and some Portland cement formulations. Lithium hydroxide (isotopically enriched in lithium-7) is used to alkalize the reactor coolant in pressurized water reactors for corrosion control.

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

CAS# 1310-65-2

Class: **Hazardous Chemical, Corrosive**

Molecular Formula: LiOH

Form (Physical State): Solid white powder or pellets (often found in aqueous solution)

Boiling Point: N/A

Melting point: 450°C (842°F)

**Potential Hazards/Toxicity**

Very hazardous in case of skin contact, eye contact, ingestion, and/or inhalation. Corrosive to eyes and skin. The amount of tissue damage depends on length of contact. Eye contact can result in corneal damage or blindness. Skin contact can produce inflammation and blistering. Inhalation of dust will produce irritation to gastro-intestinal or respiratory tract, characterized by burning, sneezing and coughing. Severe over-exposure can produce lung damage, choking, unconsciousness or death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

***Acute toxicity***

***Oral LD50 [mouse]*** *363 mg/kg*

***Oral LD50 [rat]*** *210 mg/kg*

***Dust LC50 [rat]*** *960 mg/m3 4 hours*

**Personal Protective Equipment (PPE)**

**Respiratory protection**

A respirator that provides protection against particulates (N95/100 mask, ½ or full face respirator with P100 cartridges) should be used any time there is the potential for lithium hydroxide to be airborne (via dust, vapor, mist or gas) and a fume hood cannot be used.

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/).

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

**Hand protection**

Neoprene, nitrile, or butyl rubber gloves are recommended. Consult with your preferred glove manufacturer to ensure that the gloves you plan on using are compatible with lithium hydroxide.

**Eye protection**

When handling the chemical, wear chemical splash goggles.

**Skin and body protection**

Lab coat, full length pants or equivalent, and closed toe shoes. Wear a chemical resistant apron during activities which pose a splash hazard.

**Hygiene measures**

Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling.

**Engineering Controls**

Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. A fume hood should be used when handling lithium hydroxide powder and when preparing solutions of lithium hydroxide.

**First Aid Procedures**

**If inhaled**

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

**In case of skin contact**

Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. In case of severe skin contact, wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Get medical attention immediately.

**In case of eye contact**

Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

**If swallowed**

Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

**Special Handling and Storage Requirements**

**Precautions for safe handling**

Avoid contact with skin and eyes. Avoid formation of dust and aerosols. A fume hood should be used when handling lithium hydroxide powder and when preparing solutions of lithium hydroxide. Always add lithium hydroxide to water while stirring; never the reverse. Provide adequate cooling capacity (e.g ice bath) when preparing concentrated solutions of lithium hydroxide as it reacts exothermically with water.

**Conditions for safe storage**

Lithium hydroxide is hygroscopic; store in a cool, dry area with the container tightly closed to minimize absorption of water from the air. Store in a secondary container with other bases segregated away from acids, flammables, and oxidizers. Cabinets where significant quantities of lithium hydroxide and/or other acids and bases are stored must be labeled with the hazard warning “Corrosive.” All corrosives greater than or equal to 1M in concentration must be stored in secondary containment at all times.

**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”]**

Instruments and benches contaminated with lithium hydroxide should be decontaminated with soap and water. All lithium hydroxide waste and contaminated disposables should be disposed of as hazardous waste.

**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 approval from PI.

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

* Prior to conducting any work with Lithium Hydroxide 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.

I have read and understand the content of this SOP:

**Name Signature Date**

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