

Standard Operating Procedure

Lithium

Purpose

Lithium is a soft, silver-white-grey alkali metal with atomic number 3. It is highly flammable and reactive with water producing flammable gases that can ignite spontaneously. Due to its high reactivity, it never occurs free in nature and is usually stored in mineral oil. It may be harmful if ingested, inhaled, or absorbed through the skin. It can cause skin and eye burns with irreversible damage. It can be extremely destructive to the upper respiratory tract leading to pulmonary edema. Lithium has several industrial applications including its use in batteries, heat-resistant glass and ceramics, lubricating greases, alloys in aircraft parts, pyrotechnic colorant, specialist optics, rocket propellants, production of polymer and fine-chemicals, and as a source for alpha particles.

Physical & Chemical Properties/Definition of Chemical Group

CAS#: 7439-93-2

Class: **Water reactive, flammable, corrosive**

Molecular Formula: Li

Form (physical state): Solid

Color: Silver white, silver grey

Boiling point: 1317.2-1,342 °C

Potential Hazards/Toxicity

Flammable solid. Light sensitive. Contact with water releases flammable gases which may ignite spontaneously. May ignite or explode upon contact with moist air. Handle under inert gas and protect from moisture. May be harmful if inhaled, ingested, or absorbed through the skin. May cause digestive tract irritation with burns. Causes skin and eye burns. May cause chemical conjunctivitis and corneal damage. Extremely destructive to the tissue of the mucous membranes and upper respiratory tract. May cause pulmonary edema. May cause kidney and lung damage. May cause central nervous system effects.

Personal Protective Equipment (PPE)

Respirator Protection

Use a full-face respirator with multi-purpose combination (US) respirator cartridges.

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 EH&S. This is a regulatory requirement.

Hand Protection

Handle with gloves. Nitrile gloves are recommended.

NOTE: Consult with your preferred glove manufacturer to ensure that the gloves you plan on using are compatible with hydrochloric acid.

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, tight-fitting safety glasses/goggles. Face shields are recommended.

Skin and Body Protection

Lab personnel working with the chemical need to wear full-length pants or its equivalent, closed-toe footwear with no skin being exposed, and a lab coat.

Hygiene Measures

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

Engineering Controls

Lithium should be used in a glove box or in a closed system in a certified chemical fume hood. Handle under argon gas.

First Aid Procedures

If inhaled

Move person into fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Consult a physician.

In case of skin contact

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

In case of eye contact

Rinse thoroughly with plenty of water for at least 30 minutes lifting lower and upper eyelids and removing contact lenses. 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. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Consult a physician.

Special Handling and Storage Requirements

Precautions for safe handling: Avoid contact with eyes, skin, and clothing. Do not ingest or inhale. Avoid dust formation. Provide adequate exhaust ventilation. Keep away from sources of ignition – No smoking.

Conditions for safe storage: Keep container tightly closed in a dry and well-ventilated place. Never allow contact with water. Incompatible with oxidizing agents and acidic materials. Store protected from light. Handle and store under argon gas. Store locked up.

Spill and Accident Procedure

Chemical Spill Dial 9-911 and 228-7864

Spill – Assess the extent of danger. Help contaminated or injured persons. Evacuate the spill area. Avoid breathing vapors. If possible, confine the spill to a small area using a spill kit or absorbent material. Keep others from entering contaminated area (e.g., use caution tape, barriers, etc.).

Small (<1 L) – If you have training, you may assist in the clean-up effort. Use appropriate personal protective equipment and clean-up material for chemical spilled. Double bag spill waste in clear plastic bags, label and take to the next chemical waste pick-up.

Large (>1 L) – Dial 9-911 and EH&S at 228-7864 for assistance.

Chemical Spill on Body or Clothes – Remove clothing and rinse body thoroughly in emergency shower for at least 15 minutes. Seek medical attention. *Notify supervisor and EH&S at 228-7864 immediately.*

Chemical Splash Into Eyes – Immediately rinse eyeball and inner surface of eyelid with water from the emergency eyewash station for 15 minutes by forcibly holding the eye open. Seek medical attention. *Notify supervisor and EH&S at 228-7864 immediately.*

Medical Emergency Dial 9-911 or 228-7864

Life Threatening Emergency, After Hours, Weekends And Holidays – Dial 9-911 *Note: All serious injuries must be reported to EH&S at 228-7864 within 8 hours.*

Non-Life Threatening Emergency – Go to the Olivewood Meadows Occupational Health 374 Olive during regular business hours. All other times report to Mercy Medical Center 315 Mercy Ave. *Note: All serious injuries must be reported to EH&S at 228-7864 within 8 hours.*

Needle stick/puncture exposure (as applicable to chemical handling procedure) – Wash the affected area with antiseptic soap and warm water for 15 minutes. For mucous membrane exposure, flush the affected area for 15 minutes using an eyewash station. Go to the Olivewood Meadows Occupational Health 374 Olive during regular business hours. All other times report to Mercy Medical Center 315 Mercy Ave. *Note: All needle stick/puncture exposures must be reported to EH&S at 228-7864 within 8 hours.*

Decontamination/Waste Disposal Procedure

Wearing proper PPE, sweep up or shovel. Do not flush with water. Collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal following the guidelines below.

General hazardous waste disposal guidelines:

Label Waste

- Affix an on-line hazardous waste tag on all waste containers using the Online Tag Program <http://otp.ucop.edu/> as soon as the first drop of waste is added to the container

Store Waste

- Store hazardous waste in closed containers, in secondary containment and in a designated location
- Double-bag dry waste using transparent bags
- Waste must be under the control of the person generating & disposing of it

Dispose of Waste

- Dispose of regularly generated chemical waste within 90 days
- Call EH&S at 228-7864 for questions
- Empty Containers
 - Dispose as hazardous waste if it once held extremely hazardous waste (irrespective of the container size) A list can be found at <http://ehs.ucla.edu/Pub/ExtremelyHazardousWaste.pdf>

Prepare for transport to pick-up location

- Check on-line waste tag
- Use secondary containment

Safety Data Sheet (SDS) Location

Online SDS can be accessed at <http://ehs.ucmerced.edu/material-safety-data-sheets>.

Protocol/Procedure

Cut to desired size, scrape surfaces to remove surface oxide, use as electrode in either jar cell, Swagelok cell, or coin cell.

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 hydrochloric acid, 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 a copy of 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 one year.

I have read and understand the content, requirements, and responsibilities of this SOP:

Name	Signature	Date
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