

# LITHIUM

LTM

## CAUTIONARY RESPONSE INFORMATION

<b>Common Synonyms</b>	Soft solid      White to light silver      Odorless
	Reacts violently with water. Flammable gas is produced.
	<p>Evacuate.  <b>KEEP PEOPLE AWAY. AVOID CONTACT WITH SOLID.</b>  Wear rubber overclothing (including gloves).  Shut off ignition sources and call fire department.  Notify local health and pollution control agencies.</p>
<b>Fire</b>	<p>Combustible.  Irritating gases may be produced when heated.  Wear goggles and self-contained breathing apparatus.  Extinguish with dry graphite, soda ash, or other inert powder.  <b>DO NOT USE WATER, FOAM, DRY CHEMICALS OR CARBON DIOXIDE ON FIRE.</b>  <b>DO NOT USE WATER OR FOAM ON ADJACENT FIRES.</b></p>
<b>Exposure</b>	<p>CALL FOR MEDICAL AID.</p> <p>SOLID  Will burn skin and eyes.  Harmful if swallowed.  Remove contaminated clothing and shoes.  Flush affected areas with plenty of water.  <b>IF IN EYES</b>, hold eyelids open and flush with plenty of water.  <b>IF SWALLOWED</b> and victim is CONSCIOUS, have victim drink water or milk.  <b>IF SWALLOWED</b> and victim is UNCONSCIOUS OR HAVING CONVULSIONS, do nothing except keep victim warm.</p>
<b>Water Pollution</b>	<p>Effect of low concentrations on aquatic life is unknown.  May be dangerous if it enters water intakes.  Notify local health and wildlife officials.  Notify operators of nearby water intakes.</p>

### 1. CORRECTIVE RESPONSE ACTIONS

Dilute and disperse  
Stop discharge  
Chemical and Physical Treatment:  
Neutralize

### 2. CHEMICAL DESIGNATIONS

2.1 **CG Compatibility Group:** Not listed.  
2.2 **Formula:** Li  
2.3 **IMO/UN Designation:** 4.3/1415  
2.4 **DOT ID No.:** 1415  
2.5 **CAS Registry No.:** 7439-93-2  
2.6 **NAERG Guide No.:** 138  
2.7 **Standard Industrial Trade Classification:** 52228

### 3. HEALTH HAZARDS

- 3.1 **Personal Protective Equipment:** Rubber or plastic gloves; face shield; respirator; fire-retardant clothing
- 3.2 **Symptoms Following Exposure:** Contact with eyes causes caustic irritation or burn. Incontact with skin lithium reacts with body moisture to cause chemical burns: foil, ribbon, and wire react relatively slowly.
- 3.3 **Treatment of Exposure:** EYES or SKIN: flush with water and treat with boric acid.
- 3.4 **TLV-TWA:** Not listed.
- 3.5 **TLV-STEL:** Not listed.
- 3.6 **TLV-Ceiling:** Not listed.
- 3.7 **Toxicity by Ingestion:** Currently not available
- 3.8 **Toxicity by Inhalation:** Currently not available.
- 3.9 **Chronic Toxicity:** Currently not available
- 3.10 **Vapor (Gas) Irritant Characteristics:** Currently not available
- 3.11 **Liquid or Solid Characteristics:** Currently not available
- 3.12 **Odor Threshold:** Currently not available
- 3.13 **IDLH Value:** Not listed.
- 3.14 **OSHA PEL-TWA:** Not listed.
- 3.15 **OSHA PEL-STEL:** Not listed.
- 3.16 **OSHA PEL-Ceiling:** Not listed.
- 3.17 **EPA AEGL:** Not listed

### 4. FIRE HAZARDS

- 4.1 **Flash Point:**  
Not pertinent
- 4.2 **Flammable Limits in Air:** (combustible solid) Not pertinent
- 4.3 **Fire Extinguishing Agents:** Graphite, lithium chloride
- 4.4 **Fire Extinguishing Agents Not to Be Used:** Water, sand, halogenated hydrocarbons, carbon dioxide, soda-acid, or dry chemical
- 4.5 **Special Hazards of Combustion Products:** Strong alkali fumes are formed in fire.
- 4.6 **Behavior in Fire:** Molten lithium is quite easily ignited and is then difficult to extinguish. Hot or burning lithium will react with all gases except those of the helium-argon group. It also reacts violently with concrete, wood, asphalt, sand, asbestos; and in fact, nearly everything except metal. Do not apply water to adjacent fires. Hydrogen explosion may result.
- 4.7 **Auto Ignition Temperature:** 354°F
- 4.8 **Electrical Hazards:** Not pertinent
- 4.9 **Burning Rate:** Not pertinent
- 4.10 **Adiabatic Flame Temperature:** Currently not available
- 4.11 **Stoichiometric Air to Fuel Ratio:** Not pertinent.
- 4.12 **Flame Temperature:** Currently not available
- 4.13 **Combustion Molar Ratio (Reactant to Product):** Not pertinent.
- 4.14 **Minimum Oxygen Concentration for Combustion (MOCC):** Not listed

### 5. CHEMICAL REACTIVITY

- 5.1 **Reactivity with Water:** Reacts violently to form flammable hydrogen gas and strong caustic solution. Ignition usually occurs.
- 5.2 **Reactivity with Common Materials:** May ignite combustible materials if they are damp.
- 5.3 **Stability During Transport:** Stable, if air and moisture are excluded.
- 5.4 **Neutralizing Agents for Acids and Caustics:** Residues should be flushed with water, then rinsed with dilute acetic acid.
- 5.5 **Polymerization:** Not pertinent
- 5.6 **Inhibitor of Polymerization:** Not pertinent

### 6. WATER POLLUTION

- 6.1 **Aquatic Toxicity:**  
Currently not available
- 6.2 **Waterfowl Toxicity:** Currently not available
- 6.3 **Biological Oxygen Demand (BOD):** None
- 6.4 **Food Chain Concentration Potential:** None
- 6.5 **GESAMP Hazard Profile:** Not listed

### 7. SHIPPING INFORMATION

- 7.1 **Grades of Purity:** Pure, 99.9%; Powder, shot, wire, ribbon, rod.
- 7.2 **Storage Temperature:** Ambient
- 7.3 **Inert Atmosphere:** Inerted
- 7.4 **Venting:** Safety relief
- 7.5 **IMO Pollution Category:** Currently not available
- 7.6 **Ship Type:** Currently not available
- 7.7 **Barge Hull Type:** Currently not available

### 8. HAZARD CLASSIFICATIONS

- 8.1 **49 CFR Category:** Dangerous When Wet
- 8.2 **49 CFR Class:** 4.3
- 8.3 **49 CFR Package Group:** I
- 8.4 **Marine Pollutant:** No
- 8.5 **NFPA Hazard Classification:**
- | Category                  | Classification |
|---------------------------|----------------|
| Health Hazard (Blue)..... | 1              |
| Flammability (Red).....   | 1              |
| Instability (Yellow)..... | 2              |
| Special (White).....      | W              |
- 8.6 **EPA Reportable Quantity:** Not listed.
- 8.7 **EPA Pollution Category:** Not listed.
- 8.8 **RCRA Waste Number:** Not listed
- 8.9 **EPA FWPCA List:** Not listed

### 9. PHYSICAL & CHEMICAL PROPERTIES

- 9.1 **Physical State at 15° C and 1 atm:** Solid
- 9.2 **Molecular Weight:** 6.939
- 9.3 **Boiling Point at 1 atm:** Not pertinent
- 9.4 **Freezing Point:** Not pertinent
- 9.5 **Critical Temperature:** Not pertinent
- 9.6 **Critical Pressure:** Not pertinent
- 9.7 **Specific Gravity:** 0.53 at 20°C (solid)
- 9.8 **Liquid Surface Tension:** Not pertinent
- 9.9 **Liquid Water Interfacial Tension:** Not pertinent
- 9.10 **Vapor (Gas) Specific Gravity:** Not pertinent
- 9.11 **Ratio of Specific Heats of Vapor (Gas):** Not pertinent
- 9.12 **Latent Heat of Vaporization:** Not pertinent
- 9.13 **Heat of Combustion:** -18,470 Btu/lb = -10,260 cal/g = -429.3 X 10<sup>5</sup> J/kg
- 9.14 **Heat of Decomposition:** Not pertinent
- 9.15 **Heat of Solution:** -31,500 Btu/lb = -17,500 cal/g = -733 X 10<sup>5</sup> J/kg
- 9.16 **Heat of Polymerization:** Not pertinent
- 9.17 **Heat of Fusion:** 158.5 cal/g
- 9.18 **Limiting Value:** Currently not available
- 9.19 **Reid Vapor Pressure:** Currently not available

NOTES

# LITHIUM

LTM

9.20 SATURATED LIQUID DENSITY		9.21 LIQUID HEAT CAPACITY		9.22 LIQUID THERMAL CONDUCTIVITY		9.23 LIQUID VISCOSITY	
Temperature (degrees F)	Pounds per cubic foot	Temperature (degrees F)	British thermal unit per pound-F	Temperature (degrees F)	British thermal unit inch per hour-square foot-F	Temperature (degrees F)	Centipoise
	N O T  P E R T I N E N T		N O T  P E R T I N E N T		N O T  P E R T I N E N T		N O T  P E R T I N E N T

9.24 SOLUBILITY IN WATER		9.25 SATURATED VAPOR PRESSURE		9.26 SATURATED VAPOR DENSITY		9.27 IDEAL GAS HEAT CAPACITY	
Temperature (degrees F)	Pounds per 100 pounds of water	Temperature (degrees F)	Pounds per square inch	Temperature (degrees F)	Pounds per cubic foot	Temperature (degrees F)	British thermal unit per pound-F
	R E A C T S		N O T  P E R T I N E N T		N O T  P E R T I N E N T		N O T  P E R T I N E N T