SAFETY DATA SHEETS

According to Globally Harmonized System of Classification and Labelling of Chemicals (GHS) - Sixth revised edition

Version: 1.0

Creation Date: Aug 16, 2017

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1. Identification

1.1 GHS Product identifier

Product name	lithium atom

1.2 Other means of identification

Product number	-
Other names	rolledfoil

1.3 Recommended use of the chemical and restrictions on use

Identified uses	For industry use only. Intermediates
Uses advised against	no data available

2. Hazard identification

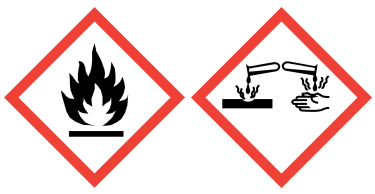
2.1 Classification of the substance or mixture

Substances and mixtures, which in contact with water, emit flammable gases, Category 1

Skin corrosion, Category 1B

2.2 GHS label elements, including precautionary statements

Pictogram(s)



Signal word

Danger

Hazard statement(s)	H260 In contact with water releases flammable gases which may ignite spontaneously
	H314 Causes severe skin burns and eye damage
Precautionary statement(s) Prevention	P223 Do not allow contact with water.
	P231+P232 Handle and store contents under inert gas/.... Protect from moisture.
	P280 Wear protective gloves/protective clothing/eye protection/face protection.
	P260 Do not breathe dust/fume/gas/mist/vapours/spray.
	P264 Wash ... thoroughly after handling.
Response	P302+P335+P334 IF ON SKIN: Brush off loose particles from skin. Immerse in cool water [or wrap in wet bandages].
	P370+P378 In case of fire: Use ... to extinguish.
	P301+P330+P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
	P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
	P363 Wash contaminated clothing before reuse.
	P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
	P310 Immediately call a POISON CENTER/doctor/⋯
	P321 Specific treatment (see ... on this label).
	P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Storage	P402+P404 Store in a dry place. Store in a closed container. P405 Store locked up.
Disposal	P501 Dispose of contents/container to ...

2.3 Other hazards which do not result in classification

none

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3. Composition/information on ingredients

3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
lithium atom	lithium atom	7439-93-2	none	100%

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4. First-aid measures

4.1 Description of necessary first-aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled

Fresh air, rest. Half-upright position. Refer for medical attention.

In case of skin contact

Remove contaminated clothes. Rinse skin with plenty of water or shower. Refer for medical attention .

In case of eye contact

First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

If swallowed

Refer for medical attention . See Notes.

4.2 Most important symptoms/effects, acute and delayed

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. (USCG, 1999)

4.3 Indication of immediate medical attention and special treatment needed, if necessary

Basic treatment: Establish a patent airway (oropharyngeal or nasopharyngeal airway, if needed). Suction if necessary. Watch for signs of respiratory insufficiency and assist ventilations if necessary. Administer oxygen by nonrebreather mask at 10 to 15 L/min. Monitor for pulmonary edema and treat if necessary ... . Monitor for shock and treat if necessary ... . Anticipate seizures and treat if necessary ... . For eye contamination, flush eyes immediately with water. Irrigate each eye continuously with 0.9% saline (NS) during treatment ... . Do not use emetics. For ingestion, rinse mouth and administer 5 ml/kg up to 200 ml of water for dilution if the patient can swallow, has a strong gag reflex, and does not drool ... . Cover skin burns with dry sterile dressings after decontamination ... . /Lithium and related compounds/

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5. Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media

Extinguish lithium fires only with chemicals designed for this purpose.

5.2 Specific hazards arising from the chemical

Special Hazards of Combustion Products: Strong alkali fumes are formed in fire. 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. (USCG, 1999)

5.3 Special protective actions for fire-fighters

Wear self-contained breathing apparatus for firefighting if necessary.

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6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust. For personal protection see section 8.

6.2 Environmental precautions

Personal protection: complete protective clothing including self-contained breathing apparatus. Consult an expert! Do NOT wash away into sewer. Sweep spilled substance into covered dry, metallic, sealable containers. Carefully collect remainder. Then store and dispose of according to local regulations.

6.3 Methods and materials for containment and cleaning up

Eliminate all ignition sources. Keep water away from release. Shovel into suitable dry container.

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7. Handling and storage

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Avoid exposure - obtain special instructions before use.Provide appropriate exhaust ventilation at places where dust is formed. For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Fireproof. Separated from strong oxidants, acids, halons and other incompatible materials. See Chemical Dangers. Dry. Keep under mineral oil.Store in a cool, dry, well-ventilated location. Separate from water.

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8. Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure limit values

no data available

Biological limit values

no data available

8.2 Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

8.3 Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Safety glasses with side-shields conforming to EN166. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Wear impervious clothing. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace. Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique(without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Respiratory protection

Wear dust mask when handling large quantities.

Thermal hazards

no data available

9. Physical and chemical properties

Physical state	soft silver metal
Colour	Soft silvery-white metal
Odour	ODORLESS
Melting point/ freezing point	180°C
Boiling point or initial boiling point and boiling range	1342°C(lit.)
Flammability	Flammable. Many reactions may cause fire or explosion. Gives off irritating or toxic fumes (or gases) in a fire.
Lower and upper explosion limit / flammability limit	no data available

Flash point	no data available
Auto-ignition temperature	178.89°C (USCG, 1999)
Decomposition temperature	no data available
pH	no data available
Kinematic viscosity	no data available
Solubility	In water:REACTS
Partition coefficient n-octanol/water (log value)	no data available
Vapour pressure	7.90X10-11 Pa (5.92X10-13 mm Hg) at 400 K (127°C); 0.000489 Pa (3.67X10-6 mm Hg) at 600 K (327°C); 1.08 Pa (0.00810 mm Hg) at 800 K (524°C); 109 Pa (0.818 mm Hg) at 1000 K (727°C)
Density and/or relative density	0.534g/mLat 25°C(lit.)
Relative vapour density	no data available
Particle characteristics	no data available

10. Stability and reactivity

10.1 Reactivity

no data available

10.2 Chemical stability

Decomposes in water

10.3 Possibility of hazardous reactions

... Flammable solid.Burns in air, oxygen, nitrogen, hydrogen, and carbon dioxide. The reactions can become extremely violent at higher temperatures. The disposition to ignite of surfaces of molten lithium exposed to any of these gases is increased by the presence of lithium oxides and nitrides. Lithium reacts avidly with water to generate gaseous hydrogen and a solution of lithium hydroxide (a caustic). Contact with halogenated hydrocarbons can produce extremely violent reactions, especially on impact [Haz. Chem. Data 1966]. Boron trifluoride reacts with incandescence when heated with lithium [Merck 11th ed. 1989]. Maleic anhydride decomposes explosively in the presence of lithium [Chemical Safety Data Sheet SD-88. 1962, Chem. Haz. Info. Series C-71. 1960]. Chlorine vapors and lithium react producing a luminous flame [Mellor 2, Supp.

1:380. 1956]. The product of the reaction between lithium and carbon monoxide, lithium carbonyl, detonates violently with water, igniting the gaseous products [Mellor 2, Supp. 2:84. 1961]. The reaction of lithium and ferrous sulfide starts around 260° C with subsequent rise in temperature to 950° C [Mellor 2, Supp. 2:80. 1961]. A truck, which was carrying lithium batteries, sodium dithionite and derivatives of cyanide, caught fire; multiple explosions occurred as the cargo was exposed to the air.

10.4 Conditions to avoid

no data available

10.5 Incompatible materials

Reacts with water forming lithium hydroxide and hydrogen. Keep under mineral oil or other liquid free from oxygen or water.

10.6 Hazardous decomposition products

Combustion may produce irritants and toxic gases.

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11. Toxicological information

Acute toxicity

- Oral: no data available
- Inhalation: no data available
- Dermal: no data available

Skin corrosion/irritation

no data available

Serious eye damage/irritation

no data available

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

no data available

Carcinogenicity

no data available

Reproductive toxicity

no data available

STOT-single exposure

no data available

STOT-repeated exposure

no data available

Aspiration hazard

no data available

12. Ecological information

12.1 Toxicity

- Toxicity to fish: no data available
- Toxicity to daphnia and other aquatic invertebrates: no data available
- Toxicity to algae: no data available
- Toxicity to microorganisms: no data available

12.2 Persistence and degradability

no data available

12.3 Bioaccumulative potential

no data available

12.4 Mobility in soil

no data available

12.5 Other adverse effects

no data available

13. Disposal considerations

13.1 Disposal methods

Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

14. Transport information

14.1 UN Number

ADR/RID: UN1415 IMDG: UN1415 IATA: UN1415

14.2 UN Proper Shipping Name

ADR/RID: LITHIUM
IMDG: LITHIUM
IATA: LITHIUM

14.3 Transport hazard class(es)

ADR/RID: 4.3 IMDG: 4.3 IATA: 4.3

14.4 Packing group, if applicable

ADR/RID: III IMDG: III IATA: III

14.5 Environmental hazards

ADR/RID: no IMDG: no IATA: no

14.6 Special precautions for user

no data available

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

no data available

15. Regulatory information

15.1 Safety, health and environmental regulations specific for the product in question

Chemical name	Common names and synonyms	CAS number	EC number
lithium atom	lithium atom	7439-93-2	none
European Inventory of Existing Commercial Chemical Substances (EINECS)			Listed.
EC Inventory			Listed.
United States Toxic Substances Control Act (TSCA) Inventory			Listed.
China Catalog of Hazardous chemicals 2015			Listed.
New Zealand Inventory of Chemicals (NZIoC)			Listed.
Philippines Inventory of Chemicals and Chemical Substances (PICCS)			Listed.
Vietnam National Chemical Inventory			Listed.
Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)			Listed.

16. Other information

Information on revision

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Abbreviations and acronyms

- CAS: Chemical Abstracts Service
- ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
- RID: Regulation concerning the International Carriage of Dangerous Goods by Rail
- IMDG: International Maritime Dangerous Goods
- IATA: International Air Transportation Association
- TWA: Time Weighted Average
- STEL: Short term exposure limit
- LC50: Lethal Concentration 50%

- LD50: Lethal Dose 50%
- EC50: Effective Concentration 50%

References

- IPCS - The International Chemical Safety Cards (ICSC), website: http://www.ilo.org/dyn/icsc/showcard.home
- HSDB - Hazardous Substances Data Bank, website: https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm
- IARC - International Agency for Research on Cancer, website: http://www.iarc.fr/
- eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en
- CAMEO Chemicals, website: http://cameochemicals.noaa.gov/search/simple
- ChemIDplus, website: http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp
- ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: http://www.phmsa.dot.gov/hazmat/library/erg
- Germany GESTIS-database on hazard substance, website: http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp
- ECHA - European Chemicals Agency, website: https://echa.europa.eu/
