

SAFETY DATA SHEET

Date of Issue: 6/06/2018

Issue No 2

Last revision: June 2018

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1.1 Identification of the Substance / Preparation and the Company / Undertaking

Product Name: **LITHIUM TETRABORATE**

Product Code: 11401194

Chemical name/synonyms: Lithium Tetraborate

Trade Names:

Chemical Family: Alkali Tetraborates

Molecular Formula: $\text{Li}_2\text{B}_4\text{O}_7$

EC No.: 234-514-3

Cas No : 12007-60-2

1.2.1 Relevant identified uses of the substance

The product is used in Xray fluorescence sample preparation.

1.2.2 Uses advised against

None

1.3. Details of the supplier of the safety data sheet

Supplier:

Klen International (74) Pty Ltd;

36 Hemisphere Street

Neerabup WA 6031

Email: info@klen.com.au

ABN: 25 008 776 681

Fax: (+618)9306 8922

Tel: (+618) 9306 8900

Contact Point - Chemist - Tel (+618) 9306 8900

EMERGENCY TELEPHONE: A/H (+61) 417 188 935

2. Hazards Identification

2.1. GHS Classification

Skin Corrosion/irritation (Category 2)

Serious eye damage/eye irritation (Category 2)

Specific target organ toxicity – single exposure (Category 3), Respiratory system

2.2 GHS Label elements, including precautionary statements

Pictogram :



Signal word: Warning

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Hazard statement(s)

H315 Causes skin irritation
 H319 Causes serious eye irritation
 H335 May cause respiratory irritation

Precautionary statements:

Prevention

P261 Avoid breathing dust/fume/mist/vapours/spray.
 P264 Wash skin thoroughly after handling.
 P271 Use only outdoors or in a well ventilated area.
 P280 Wear eye protection/ face protection.
 P280 Wear protective gloves.

Response

P304 + P340 + P312 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call POISON CENTER or doctor/physician if you feel unwell.
 P332 + P313 If skin irritation occurs: Get medical advice / attention.
 P337 + P313 If eye irritation persists: Get medical advice / attention.

Storage

P403 + P233 Store in a well ventilated place. Keep container tightly closed.

Disposal

P501 Dispose of contents /container to an approved waste disposal plant.

2.3. Other hazards - none

3. Composition / Information on Ingredients

CAS#	Chemical Name	%
12007-60-2	Lithium Tetraborate	>99

EC Index No: Lithium tetraborate 234-514-3

Classification : Skin Irrit. 2; Eye Irrit.2; STOT SE 3; H315, H319, H335. C <= 100%

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4. FIRST AID MEASURES

4.1 Description of First Aid Measures

General Advice

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

If Inhaled

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

In case of skin contact

Wash off with soap and plenty of water. Consult a physician.

In case of eye contact

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed

Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11.

4.3 Indication of any immediate medical attention and special treatment needed

No data available

5. Fire-fighting measures

5.1. Extinguishing media

Use water spray, alcohol resistant foam, dry chemical or carbon dioxide.

5.2. Special hazards arising from the substance

Borane/boron oxides, Lithium oxides.

5.3. Advice for firefighters:

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. In case of exposure to high level of airborne dust, wear a personal respirator in compliance with national legislation.

6.2. Environmental precautions

Do not let lithium tetraborate enter drains.

6.3. Methods and material for containment and cleaning up

Land spill

Vacuum, shovel or sweep up lithium tetraborate and place in containers for disposal in accordance with applicable local regulations. Avoid contamination of water bodies during clean up and disposal.

Spillage into water

Where possible, remove any intact containers from the water. Advise local water authority that none of the affected water should be used for irrigation or for the abstraction of potable water until natural dilution returns the boron value to its normal environmental background level (see sections 12, 13 and 15).

6.4. Reference to other sections

See Sections 8 and 13 for further information

7. Handling and Storage

7.1. Precautions for safe handling

Avoid contact with skin and eyes. Avoid formation of dust and aerosols. 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

Store in a cool place. Keep container tightly closed in a dry and well-ventilated place.

Moisture sensitive.

Storage class (TRGS 510) : Non Combustible Solids

7.3. Specific end use(s)

Apart from the uses mentioned in section 1.3 no other specific.

8. Exposure controls / Personal protection

8.1. Control parameters

Occupational Exposure Limit Values

None assigned

DNEL values: No data

PNEC values: No data

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8.2. Exposure controls

Appropriate engineering controls

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

Eye/Face Protection

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

Skin Protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching gloves outer surface) to avoid skin contact. Dispose of used gloves in accordance with applicable laws and good laboratory practices.

The selected gloves must satisfy specifications of EU Directive 89/686/EEC and the standard EN374 derived from it.

Body Protection

Impervious clothing. The type of equipment must be selected according to the concentration and amount of the substance being used at the workplace.

Respiratory protection

For nuisance exposures use type p95 (US) or type P1 (EU EN 143) particle respirator. For higher level protection use type OV/AG/P99 (US) or type ABEK-P2 (EU EN 143) respirator cartridges. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Odour: Odourless

Appearance: White crystalline powder

pH: a 1% suspension has a pH of 8.9

Percent Volatile: Not applicable

Vapour Pressure: Not applicable

Vapour Density: Not applicable

Boiling Point: Not applicable

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Melting Point: 915-919°C
Solubility In Water: 2.7 % by wt. @ 20°C
Evaporation Rate (Butyl Acetate = 1): Not applicable
Specific Gravity: 2.4 g/cc
Molecular Weight: 169.14
Coeff. Oil/Water: Not applicable
Odour Threshold: Not applicable
Flammable Limits: Upper: Not available Lower: Not available.
Flash Point: Not applicable
Autoignition Temperature: Not applicable
Explosive Properties: Not explosive
Oxidizing Properties: Not an oxidizer

10. STABILITY AND REACTIVITY

10.1. Reactivity

No data available..

10.2. Chemical stability

Stable under recommended storage conditions..

10.3. Possibility of hazardous reactions

No data available.

10.4. Conditions to avoid: Avoid moisture.

10.5. Incompatible materials

Reaction with strong reducing agents such as metal hydrides, acetic anhydride or alkali metals will generate hydrogen gas which could create an explosive hazard.

10.6. Hazardous decomposition products

Lithium oxide and boron oxides

11. TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effect

11.1.1. Substances

Lithium Compounds:

The toxicity of lithium compounds is a function of their solubility in water. Lithium ion has central nervous system toxicity. The initial effects of lithium exposure are tremors of the hands, nausea, micturition, slurred speech, sluggishness, sleepiness, vertigo, thirst and increased urine volume. Effects from continued exposure are apathy, anorexia, fatigue, lethargy, muscular weakness, and changes in ECG. Long-term exposure leads to hypothyroidism, leukocytosis, edema, weight gain, polydipsia/polyuria (increased water intake leading to increased urinary output), memory impairment, seizures, kidney damage, shock, hypotension, cardiac arrhythmias, coma, death. (Sax, Dangerous Properties of Industrial Materials, eighth edition).

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Lithium Tetraborate:

Acute toxicity: Low acute oral toxicity; LD50 in rats is 2,400 to 2,600 mg/kg of body weight.

Skin corrosion / irritation:

Low acute dermal toxicity; For sodium borates, LD50 in rabbits is greater than 2,000 mg/kg of body weight. Lithium tetraborate is poorly absorbed through intact skin Non-irritant.

Serious eye damage/ irritation: Lithium tetraborate is a serious eye irritant.

Respiratory or skin sensitisation: N.A.

Germ cell mutagenicity: N.A.

Carcinogenicity: N.A.

Reproductive toxicity: Animal feeding studies in rat, mouse and dog, at high doses of sodium borates, have demonstrated effects on fertility and testes. Studies with the chemically related boric acid in rat, mouse and rabbit, at high doses, demonstrate developmental effects on the foetus including foetal weight loss and minor skeletal variations. The doses administered were many times in excess of those which humans would normally be exposed to. Human epidemiological studies show no increase in pulmonary disease in occupational populations with chronic exposures to boric acid dust and sodium borate dust. A recent epidemiology study under the conditions of normal occupational exposure to borate dusts indicated no effect on fertility.

STOT-single exposure: N.A.

STOT-repeated exposure: N.A.

Aspiration hazard: Low acute inhalation toxicity; For sodium borates, LC50 in rats is greater than 2.0 mg/l (or g/m³).

Special note: By analogy with sodium salts of boric acid, it is possible that this product could be considered toxic by ingestion, an eye and respiratory irritant; and a reproductive and developmental toxin.

12. ECOLOGICAL INFORMATION

12.1. Toxicity – no specific data for lithium borates. The following is for sodium borates

Phytotoxicity: Boron is an essential micronutrient for healthy growth of plants, however, it can be harmful to boron sensitive plants in higher quantities. Care should be taken to minimise the amount of borate product released to the environment.

Algal toxicity: Green algae, *Pseudokirchneriella subcapitata* (Hansveit and Oldersma, 2000) 72-hr EC50 –biomass = 40 mg B/L, or 229 mg boric acid/L.

Invertebrate toxicity: Daphnia, Daphnids, *Daphnia magna* (Gersich, 1984a) 48-hr LC50 = 133 mg B/L or 760 mg boric acid/L or 619 mg disodium tetraborate, anhydrous/L

Fish toxicity: Fish, Fathead minnow, *Pimephales promelas* (Soucek et al., 2010) 96-hr LC50 = 79.7 mg B/L or 456 mg boric acid/L or 370 mg disodium tetraborate, anhydrous

12.2. Persistence and degradability: Boron is naturally occurring and ubiquitous in the environment. Boron occurs naturally in sea water at an average concentration of 5 mg B/l and fresh water at 1 mg B/l or less. In dilute aqueous solutions the predominant boron species present is undissociated boric acid

12.3. Bioaccumulative potential: N.A.

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12.4. Mobility in soil: The product is soluble in water and is leachable through normal soil.

12.5. Results of PBT vPvB assessment: N.A.

12.6. Other adverse effects: N.A.

13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods: Offer surplus and non-recyclable solutions to a licensed disposal company. Dissolve or mix the material with a combustible solvent and burn it in a incinerator with an afterburner and scrubber.

14. TRANSPORT INFORMATION

Lithium borate has no UN Number, and is not regulated under international rail, road, water or air transport regulations.

14.1. UN number: N.A.

14.2. UN proper shipping name: N.A.

14.3. Transport of hazard classes: N.A.

14.4. Packing group: N.A.

14.5. Environmental hazards: N.A.

14.6. Special precautions for user: N.A.

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: (N.A.)

15. REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/legislation specific for the substance

It should be noted that borates are safe under conditions of normal handling and use, besides, they are essential nutrients to plants, and research shows that they play a beneficial role in human health. CLP classification has been solely based on animal tests where animals were exposed to high doses of boric acid over long periods of time. These doses were many times higher than humans are exposed to under conditions of normal handling and use. Consequently, a precautionary decision was taken by the European Commission.

Clean Air Act (Montreal Protocol)

Lithium tetraborate was not manufactured with and does not contain any Class I or Class II ozone depleting substances.

Chemical inventory listing

- AICS - listed
- U.S. EPA TSCA Inventory - listed
- Canadian DSL -no
- EINECS -listed

Ensure all national/local regulations are observed.

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16. OTHER INFORMATION

A number of lithium salts (sulphate, citrate, carbonate and oratate) are used in treatment of bipolar disorder as a mood stabiliser. No information is available on lithium borates

16.2. List of abbreviation and acronyms used in this MSDS

CAS N°: Chemical Abstracts Service number

EC N° : EINECS Number : European Inventory of Existing Commercial Substances

DSD: Dangerous Substances Directive 67/548/EEC

CLP: Classification Labelling Packaging Regulation: Regulation (EC) N°1272/2008

1st ATP : 1st Adaptation to Technical and scientific Progress

LD50: Median Lethal Dose

LC50: Lethal Concentration, 50%

N.A. Not Applicable

DNEL: Derived No effect Level

PNEC: Predicted No Effect Concentration

OSHA: Occupational Safety & Health Administration

Cal OSHA: The State of California Division of Occupational Safety and Health (DOSH)

PEL: Permissible Exposure Limits

ACGIH: American Conference of Governmental Industrial Hygienists

TLV: Threshold Limit Value

Japanese MITI: Japanese Ministry of International Trade and Industry

EC50: Half maximal effective concentration

PBT: Persistent, Bioaccumulative and Toxic substance

vPvB: Very Persistent and Very Bioaccumulative

U.S. EPA TSCA Inventory: Inventory of the chemical substances manufactured or processed in the United States according to Toxic Substances Control Act compiled and published under the authority of the Environmental Protection Agency

Canadian DSL: Canadian Domestic Substances List

16.3. Exposure Scenario

An exposure Scenario for borates is available separately.

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1. Litovitz T L, Norman S A, Veltri J C, Annual Report of the American Association of Poison Control Centers Data Collection System. Am. J. Emerg. Med. (1986), 4, 427-458
 2. Weir R J, Fisher R S, Toxicol. Appl. Pharmacol., (1972), 23, 351-364
 3. National Toxicology Program (NTP) – Technical Report Series No. TR324, NIH Publication No. 88-2580 (1987), PB88 213475/XAB
 4. Fail et al., Fund. Appl. Toxicol. (1991) 17, 225-239
 5. Heindel et al., Fund. Appl. Toxicol. (1992) 18, 266-277
 6. Guhl W, SOFW-Journal (1992) 181 (18/92), 1159-1168
 7. Schoberl P, Marl and Huber L (1988) Tenside Surfactants Detergents 25, 99-107
 8. Hugman S J and Mance G (1983) Water Research Centre Report 616-M
 9. Birge W J, Black J A, EPA-560/-76-008 (April 1977) PB 267 085
- For general information on the toxicology of borates see ECETOC Technical Report No. 63 (1995); Patty's Industrial Hygiene and Toxicology, 4th Edition Vol. II, (1994) Chap. 42, 'Boron'.

This SDS has been completed in accordance with Regulation (EU) No. 1272/2008 (CLP)

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