

SAFETY DATA SHEET

Date of Issue: 27/02/2018

Issue No 2

Last revision: April 2015

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

Product Name: **XRAY FLUX 12/22**

Product Code: M1323

Chemical name/synonyms: X-Ray flux

Trade Names:

Chemical Family: Alkali Tetraborates

Molecular Formula: LiBO3 and Li2B4O7

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; AUSTRALIA

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) 419 906 672

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 Label elements including precautionary statements

Hazard pictograms



Signal word: Warning

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Hazard code and statements:

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

Precautionary statements:

Prevention

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

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

Chemical Name	Concentration %	Product Identifier	Hazard Classes and Hazard Statements
Lithium Tetraborate	35	CAS No: 12007-60-2 EC No : 234-514-3	Skin irrit Cat 2; H315 Serious eye irrit Cat 2A; H319 STOT SE Cat 3 ; H 335
Lithium Metaborate	65	CAS No: 13453-69-5 EC No : 236-631-5	not classified

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4.1. Description of 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

Hazardous decomposition products formed under fire conditions: borane/ boron oxides.

5.3. Advice for firefighters: Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information : No data available

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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 dust, vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.

6.2. Environmental precautions

Avoid dispersal of spilled material, runoff and contact with soil, waterways and sewers. Do not allow to enter drains.

6.4. Reference to other sections

See Section 7 for information on safe handling
See Section 8 for information on protective equipment
See Section 13 for disposal information.

7. Handling and Storage

7.1. Precautions for safe handling

Avoid contact with skin and eyes.
Avoid formation of dust.
Prevent formation of aerosols
Provide appropriate exhaust ventilation at places where dust is formed.

7.2. Conditions for safe storage, including any incompatibilities:

No special handling precautions are required, but dry, indoor storage is recommended. Product hygroscopic. Provide appropriate ventilation and store bags such as to prevent any accidental damage.

7.3. Specific end use(s)

No data available.

8. Exposure controls / Personal protection

8.1. Control parameters

Occupational Exposure Limit Values :

Contains no substances with occupational exposure limit values.

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8.2. Exposure controls

General protective and hygienic measures

Keep away from foodstuffs and beverages. Immediately remove all soiled and contaminated clothing. Wash hands before breaks and at the end of work shifts. Avoid contact with the eyes and skin.

Eye Protection

Wear 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 EN166 (EU).

Hand Protection

Handle with gloves that are impermeable and resistant to the product.

Skin and Body Protection

Wear impervious clothing. The type of protective equipment must be selected according to the concentration and amount of the substance at the specific 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).

8.2.3. Environmental exposure controls

No special requirement.

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 9.5 approx

Percent Volatile: Not applicable

Vapour Pressure: Not applicable

Vapour Density: Not applicable

Boiling Point: Not applicable

Melting Point: 845°C (LiBO₂) and 915-919°C (Li₂B₄O₇)

Solubility in Water: Insoluble (<1%)

Evaporation Rate (Butyl Acetate = 1): Not applicable

Specific Gravity: 1.4 to 2.4 g/cc

Molecular Weight: Not applicable

Coeff. Oil/Water: Not applicable

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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.
Viscosity: N.A.
Explosive properties: Non explosive
Oxidising properties: Non-oxidising

10. Stability and Reactivity

10.1. Reactivity

Stability in water: Dilute solutions form mainly undissociated boric acid. Concentrated solutions may polymerise.

10.2. Chemical stability

Product is stable.

10.3. Possibility of hazardous reactions

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

10.4. 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

Hazardous decomposition products: borane/ 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

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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).

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. Anhydrous borate is poorly absorbed through intact skin
Non-irritant.

Serious eye damage/ irritation: Anhydrous borate 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).

12. Ecological information

12.1. Toxicity – no specific data for lithium borates. 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. 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.

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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, Fathered 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.

12.3. Bioaccumulative potential: N.A.

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:

Small quantities of anhydrous borates can usually be disposed of at landfill sites. No special disposal treatment is required, but local authorities should be consulted about any specific local requirements. Tonnage quantities of product are not recommended to be sent to landfills. Such product should, if possible, be used for an appropriate application.

14. Transport information

Anhydrous lithium borates have 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.

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Clean Air Act (Montreal Protocol)

Anhydrous borate 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 1330-43-4
 - Canadian DSL 1330-43-4
 - EINECS 215-540-4
 - South Korea 1-760
 - Japanese MITI (1)-69
- Ensure all national/local regulations are observed.

EU Reach Regulation

Disodium Tetraborates are listed in the Candidate List of Substances of Very High Concern "SVHC" for eventual inclusion in Annex XIV to REACH Regulation 1907/2006 ("Authorisation List"). (18.06.2010- ED/30/2010).

16. Other information

16.1. Changes made to the previous version of this Safety Data Sheet (SDS):

The main additions are their inclusion as SVHC in the Candidate List (cf. section 15.1) and to the classification and labelling of our product according to the **1st ATP to CLP (Regulation EC No. 790/2009 of 10.08.2009)**

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

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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.

References

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 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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