

# TRIMETHYL BORATE

Version No:2.0  
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GHS SAFETY DATA SHEET

## Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

### PRODUCT NAME

TRIMETHYL BORATE

### OTHER NAMES

C3-H9-B-O3, (CH3O)B, B(OCH3)3, "boric acid, trimethyl ester", trimethylborine, "methyl borate", "Borester O", TMB

### PROPER SHIPPING NAME

TRIMETHYL BORATE

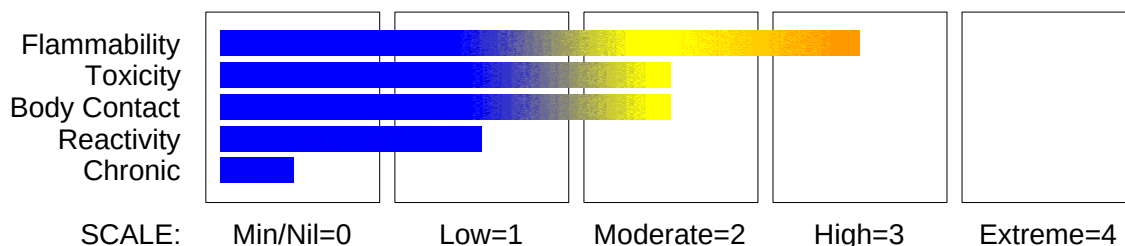
### PRODUCT USE

Liquid boron dopant in the deposition of borosilicate glasses;  
solvent for waxes, oils, resins; paint and varnish analysis;  
catalyst in ketone manufacture; promoter of diborane reactions; neutron detector gas in presence of scintillation counter; brazing flux.  
Fungicide for citrus fruits.

### SUPPLIER

Company: S D FINE- CHEM LIMITED  
Address:  
315- 317, T.V. INDUSTRIAL ESTATE,  
248, WORLI,  
MUMBAI- 400030.INDIA.  
technical@sdfine.com  
Telephone: 91- 22- 24959898  
Telephone: 91- 22- 24959899  
Fax: 91- 22- 24937232

### HAZARD RATINGS



## Section 2 - HAZARDS IDENTIFICATION

### GHS Classification

Acute Toxicity (Dermal) Category 4  
Acute Toxicity (Oral) Category 4

continued...

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Section 2 - HAZARDS IDENTIFICATION

Eye Irritation Category 2B  
Flammable Liquid Category 2  
Respiratory Effects Category 3  
Respiratory Irritation Category 3



## EMERGENCY OVERVIEW

### HAZARD

DANGER

Determined by using GHS criteria:

H335 H336 H225 H302 H312 H320

May cause respiratory irritation

May cause drowsiness and dizziness

Highly flammable liquid and vapour

Harmful if swallowed

Harmful in contact with skin

Causes eye irritation

### PRECAUTIONARY STATEMENTS

#### Prevention

Do not eat, drink or smoke when using this product.

Ground/bond container and receiving equipment.

Use only non-sparking tools.

Wear protective gloves/clothing

Wash hands thoroughly after handling.

Take precautionary measures against static discharge

Keep container tightly closed.

Keep away from heat/sparks/open flame - No smoking.

Wear protective gloves and eye/face protection.

Use explosion-proof electrical/ventilating/lighting/equipment

#### Response

IF ON SKIN: Gently wash with plenty of soap and water.

Wash contaminated clothing before reuse.

If eye irritation persists, get medical advice/attention.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Call a POISON CENTER or doctor/physician if you feel unwell.

If on skin or hair: remove/take off immediately all contaminated clothing. Rinse with water/shower.

Specific treatment: refer to Label or MSDS.

#### Storage

Store locked up.

#### Disposal

Dispose of contents and container in accordance with relevant legislation.

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## Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

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| NAME                                                   | CAS RN     | %    |
|--------------------------------------------------------|------------|------|
| trimethyl borate                                       | 121-43-7   | > 99 |
| NOTE: In presence of water decomposes to form methanol | 67-56-1    |      |
| boric acid                                             | 10043-35-3 |      |

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## Section 4 - FIRST AID MEASURES

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### SWALLOWED

For advice, contact a Poisons Information Centre or a doctor.

- If swallowed do NOT induce vomiting.
- If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
- Observe the patient carefully.
- Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious
- Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.
- Seek medical advice.

### EYE

If this product comes in contact with the eyes:

- Wash out immediately with fresh running water.
- Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
- If pain persists or recurs seek medical attention.
- Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

### SKIN

If skin contact occurs:

- Immediately remove all contaminated clothing, including footwear.
- Flush skin and hair with running water (and soap if available).
- Seek medical attention in event of irritation.

### INHALED

- If fumes or combustion products are inhaled remove from contaminated area.
- Lay patient down. Keep warm and rested.
- Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
- Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.
- Transport to hospital, or doctor, without delay.

### NOTES TO PHYSICIAN

For acute and short term repeated exposures to methanol:

- Toxicity results from accumulation of formaldehyde/formic acid.
- Clinical signs are usually limited to CNS, eyes and GI tract. Severe metabolic acidosis may produce dyspnea and profound systemic effects which may become intractable. All symptomatic patients should have arterial pH measured. Evaluate airway, breathing and circulation.
- Stabilise obtunded patients by giving naloxone, glucose and thiamine.
- Decontaminate with Ipecac or lavage for patients presenting 2 hours post-ingestion. Charcoal does not absorb well; the usefulness of cathartic is not established.

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- Forced diuresis is not effective; haemodialysis is recommended where peak methanol levels exceed 50 mg/dL (this correlates with serum bicarbonate levels below 18 mEq/L).
  - Ethanol, maintained at levels between 100 and 150 mg/dL, inhibits formation of toxic metabolites and may be indicated when peak methanol levels exceed 20 mg/dL. An intravenous solution of ethanol in D5W is optimal.
  - Folate, as leucovorin, may increase the oxidative removal of formic acid. 4-methylpyrazole may be an effective adjunct in the treatment. 8. Phenytoin may be preferable to diazepam for controlling seizure.
- [Ellenhorn Barceloux: Medical Toxicology]  
BIOLOGICAL EXPOSURE INDEX - BEI

| Determinant             | Index               | Sampling Time                       | Comment |
|-------------------------|---------------------|-------------------------------------|---------|
| 1. Methanol in urine    | 15 mg/l             | End of shift                        | B, NS   |
| 2. Formic acid in urine | 80 mg/gm creatinine | Before the shift at end of workweek | B, NS   |

- B: Background levels occur in specimens collected from subjects NOT exposed.  
NS: Non-specific determinant - observed following exposure to other materials.  
For acute or repeated short term exposures to boron and its compounds:
- Nausea, vomiting, diarrhoea and epigastric pain, haematemesis and blue-green discolouration of both faeces and vomitus characterise adult boron intoxication.
  - Access and correct any abnormalities found in airway and circulation.
  - A tidal volume of 10-15 mg/kg should be maintained.
  - Emesis should be induced unless the patient is in coma, is experiencing seizures or has lost the gag reflex. If any of these are present, gastric lavage should be performed with a large-bore tube after endotracheal intubation or in the presence of continuous respiratory action.
  - Activated charcoal is probably not of value though its use might be indicated following gastric evacuation. Catharsis might be useful to eliminate any borates remaining in the gastro-intestinal tract (magnesium sulfate: adults, 30 gms: children 250 mg/kg).
  - Peritoneal dialysis and haemodialysis remove some borates.
- [Ellenhorn and Barceloux: Medical Toxicology].

## Section 5 - FIRE FIGHTING MEASURES

### EXTINGUISHING MEDIA

- Foam.
- Dry chemical powder.
- BCF (where regulations permit).
- Carbon dioxide.
- Water spray or fog - Large fires only.

### FIRE FIGHTING

- Alert Fire Brigade and tell them location and nature of hazard.
- May be violently or explosively reactive.
- Wear breathing apparatus plus protective gloves.
- Prevent, by any means available, spillage from entering drains or water course.
- If safe, switch off electrical equipment until vapour fire hazard removed.
- Use water delivered as a fine spray to control fire and cool adjacent area.
- Avoid spraying water onto liquid pools.
- DO NOT approach containers suspected to be hot.
- Cool fire exposed containers with water spray from a protected location.
- If safe to do so, remove containers from path of fire.

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## FIRE/EXPLOSION HAZARD

- Liquid and vapour are highly flammable.
- Severe fire hazard when exposed to heat, flame and/or oxidisers.
- Vapour may travel a considerable distance to source of ignition.
- Heating may cause expansion or decomposition leading to violent rupture of containers.
- On combustion, may emit toxic fumes of carbon monoxide (CO).

## FIRE INCOMPATIBILITY

Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result.

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## Section 6 - ACCIDENTAL RELEASE MEASURES

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## EMERGENCY PROCEDURES

### MINOR SPILLS

- Remove all ignition sources.
- Clean up all spills immediately.
- Avoid breathing vapours and contact with skin and eyes.
- Control personal contact by using protective equipment.
- Contain and absorb small quantities with vermiculite or other absorbent material.
- Wipe up.
- Collect residues in a flammable waste container.

### MAJOR SPILLS

- Clear area of personnel and move upwind.
  - Alert Fire Brigade and tell them location and nature of hazard.
  - May be violently or explosively reactive.
  - Wear breathing apparatus plus protective gloves.
  - Prevent, by any means available, spillage from entering drains or water course.
  - No smoking, naked lights or ignition sources.
  - Increase ventilation.
  - Stop leak if safe to do so.
  - Water spray or fog may be used to disperse vapour.
  - Contain spill with sand, earth or vermiculite.
  - Use only spark-free shovels and explosion proof equipment.
  - Collect recoverable product into labelled containers for recycling.
  - Collect solid residues and seal in labelled drums for disposal.
  - Wash area and prevent runoff into drains.
  - After clean up operations, decontaminate and launder all protective clothing and equipment before storing and re-using.
  - If contamination of drains or waterways occurs, advise emergency services.
- Personal Protective Equipment advice is contained in Section 8 of the MSDS.**
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## Section 7 - HANDLING AND STORAGE

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## PROCEDURE FOR HANDLING

- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of overexposure occurs.
- Use in a well-ventilated area.
- Prevent concentration in hollows and sumps.
- DO NOT enter confined spaces until atmosphere has been checked.
- Avoid smoking, naked lights or ignition sources.
- Avoid generation of static electricity.

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- DO NOT use plastic buckets.
- Earth all lines and equipment.
- Use spark-free tools when handling.
- Avoid contact with incompatible materials.
- When handling, DO NOT eat, drink or smoke.
- Keep containers securely sealed when not in use.
- Avoid physical damage to containers.
- Always wash hands with soap and water after handling.
- Work clothes should be laundered separately.
- Use good occupational work practice.
- Observe manufacturer's storing and handling recommendations.
- Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions.

## SUITABLE CONTAINER

- Packing as supplied by manufacturer.
- Plastic containers may only be used if approved for flammable liquid.
- Check that containers are clearly labelled and free from leaks.

## STORAGE INCOMPATIBILITY

Avoid reaction with oxidising agents.  
Avoid strong acids.

## STORAGE REQUIREMENTS

- Store in original containers in approved flammable liquid storage area.
- DO NOT store in pits, depressions, basements or areas where vapours may be trapped.
- No smoking, naked lights, heat or ignition sources.
- Keep containers securely sealed.
- Store away from incompatible materials in a cool, dry, well-ventilated area.
- Protect containers against physical damage and check regularly for leaks.
- Observe manufacturer's storing and handling recommendations.

## SAFE STORAGE WITH OTHER CLASSIFIED CHEMICALS



+      X      X      X      X      +

+: May be stored together  
O: May be stored together with specific preventions  
X: Must not be stored together

## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

### EXPOSURE CONTROLS

The following materials had no OELs on our records

- |                     |                                                    |
|---------------------|----------------------------------------------------|
| • trimethyl borate: | CAS:121- 43- 7                                     |
| • methanol:         | CAS:67- 56- 1                                      |
| • boric acid:       | CAS:10043- 35- 3 CAS:11113- 50- 1 CAS:41685- 84- 1 |

### EMERGENCY EXPOSURE LIMITS

|          |                            |                          |
|----------|----------------------------|--------------------------|
| Material | Revised IDLH Value (mg/m3) | Revised IDLH Value (ppm) |
| methanol |                            | 6, 000                   |

continued...

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## ODOUR SAFETY FACTOR (OSF)

OSF=2 (METHANOL)

Exposed individuals are NOT reasonably expected to be warned, by smell, that the Exposure Standard is being exceeded.

Odour Safety Factor (OSF) is determined to fall into either Class C, D or E.

The Odour Safety Factor (OSF) is defined as:

OSF= Exposure Standard (TWA) ppm/ Odour Threshold Value (OTV) ppm

Classification into classes follows:

| Class | OSF     | Description                                                                                                                                                       |
|-------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A     | 550     | Over 90% of exposed individuals are aware by smell that the Exposure Standard (TLV- TWA for example) is being reached, even when distracted by working activities |
| B     | 26- 550 | As " A" for 50- 90% of persons being distracted                                                                                                                   |
| C     | 1- 26   | As " A" for less than 50% of persons being distracted                                                                                                             |
| D     | 0.18- 1 | 10- 50% of persons aware of being tested perceive by smell that the Exposure Standard is being reached                                                            |
| E     | <0.18   | As " D" for less than 10% of persons aware of being tested                                                                                                        |

## MATERIAL DATA

No exposure limits set by NOHSC or ACGIH.

### INGREDIENT DATA

BORIC ACID:

METHANOL:

These exposure guidelines have been derived from a screening level of risk assessment and should not be construed as unequivocally safe limits. ORGS represent an 8-hour time-weighted average unless specified otherwise.

CR = Cancer Risk/10000; UF = Uncertainty factor:

TLV believed to be adequate to protect reproductive health:

LOD: Limit of detection

Toxic endpoints have also been identified as:

D = Developmental; R = Reproductive; TC = Transplacental carcinogen

Jankovic J., Drake F.: A Screening Method for Occupational Reproductive

American Industrial Hygiene Association Journal 57: 641-649 (1996).

METHANOL:

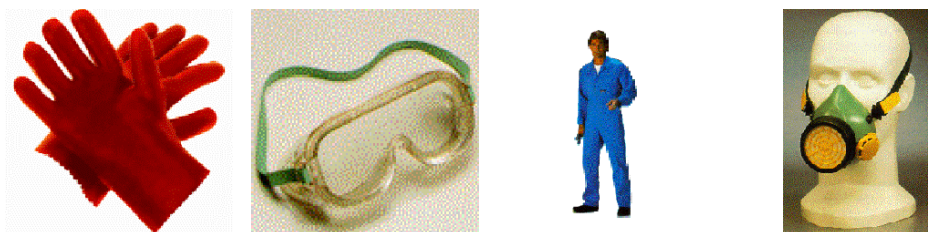
Odour Threshold Value: 4.2-5960 ppm (detection), 53.0-8940 ppm (recognition)

NOTE: Detector tubes for methanol, measuring in excess of 50 ppm, are commercially available.

Exposure at or below the recommended TLV-TWA is thought to substantially reduce the significant risk of headache, blurred vision and other ocular and systemic effects.

## PERSONAL PROTECTION

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## EYE

- Safety glasses with side shields; or as required,
- Chemical goggles.
- Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lens or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59].

## HANDS/FEET

- PVC gloves.
- Neoprene gloves.
- Safety footwear.

## OTHER

- Overalls.
- PVC Apron.
- PVC protective suit may be required if exposure severe.
- Eyewash unit.
- Ensure there is ready access to a safety shower.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required.

For further information consult your Occupational Health and Safety Advisor.

## ENGINEERING CONTROLS

Local exhaust ventilation usually required. If risk of overexposure exists, wear approved respirator. Correct fit is essential to obtain adequate protection. Supplied-air type respirator may be required in special circumstances. Correct fit is essential to ensure adequate protection.

An approved self contained breathing apparatus (SCBA) may be required in some situations. Provide adequate ventilation in warehouse or closed storage area. Air contaminants generated in the workplace possess varying "escape" velocities which, in turn, determine the "capture velocities" of fresh circulating air required to effectively remove the contaminant.

Type of Contaminant:  
solvent, vapours, degreasing etc., evaporating  
from tank (in still air).  
aerosols, fumes from pouring operations,  
intermittent container filling, low speed

Air Speed:  
0.25- 0.5 m/s (50- 100 f/min.)  
0.5- 1 m/s (100- 200 f/min.)

continued...

# TRIMETHYL BORATE

## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

conveyer transfers, welding, spray drift, plating acid fumes, pickling (released at low velocity into zone of active generation)

direct spray, spray painting in shallow booths, drum filling, conveyer loading, crusher dusts, gas discharge (active generation into zone of rapid air motion)

1- 2.5 m/s (200- 500 f/min.)

grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion).

2.5- 10 m/s (500- 2000 f/min.)

Within each range the appropriate value depends on:

Lower end of the range

1: Room air currents minimal or favourable to capture

2: Contaminants of low toxicity or of nuisance value only.

3: Intermittent, low production.

4: Large hood or large air mass in motion

Upper end of the range

1: Disturbing room air currents

2: Contaminants of high toxicity

3: High production, heavy use

4: Small hood- local control only

Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (in simple cases). Therefore the air speed at the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 1-2 m/s (200-400 f/min) for extraction of solvents generated in a tank 2 meters distant from the extraction point. Other mechanical considerations, producing performance deficits within the extraction apparatus, make it essential that theoretical air velocities are multiplied by factors of 10 or more when extraction systems are installed or used.

## Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

### APPEARANCE

Colourless, highly flammable liquid. Soluble in alcohol, ether, benzene. Miscible with hexane, tetrahydrofuran, isopropylamine, methanol, other organic liquids.

Stable in presence of moisture, but in presence of water or steam hydrolyses to methanol and boric acid.

### PHYSICAL PROPERTIES

Liquid.

Molecular Weight: 103.92

Melting Range (°C): - 29.3

Solubility in water (g/L): Reacts

pH (1% solution): Not applicable

Volatile Component (%vol): Not available.

Relative Vapour Density (air=1): 3.59

Lower Explosive Limit (%): Not available.

Autoignition Temp (°C): Not available.

State: Liquid

Boiling Range (°C): 67.9

Specific Gravity (water=1): 0.92

pH (as supplied): Not applicable

Vapour Pressure (kPa): Not available.

Evaporation Rate: Not available

Flash Point (°C): - 8.33

Upper Explosive Limit (%): Not available.

Decomposition Temp (°C): Not available

log Kow: -0.82- -0.66

continued...

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## Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

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### CONDITIONS CONTRIBUTING TO INSTABILITY

Hazardous polymerisation will not occur.

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## Section 11 - TOXICOLOGICAL INFORMATION

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### POTENTIAL HEALTH EFFECTS

#### ACUTE HEALTH EFFECTS

##### SWALLOWED

Although ingestion is not thought to produce harmful effects (as classified under EC Directives), the material may still be damaging to the health of the individual, following ingestion, especially where pre-existing organ (e.g liver, kidney) damage is evident. Present definitions of harmful or toxic substances are generally based on doses producing mortality rather than those producing morbidity (disease, ill-health). Gastrointestinal tract discomfort may produce nausea and vomiting. In an occupational setting however, ingestion of insignificant quantities is not thought to be cause for concern.

Methanol may produce a burning or painful sensation in the mouth, throat, chest and stomach. This may be accompanied by nausea, vomiting, headache, dizziness, shortness of breath, weakness, fatigue, leg cramps, restlessness, confusion, drunken behaviour, visual disturbance, drowsiness, coma and death. Onset of symptoms may be delayed for several hours. Effects are due partly to acidosis and partly to cerebral oedema. Visual impairment produces blurring, double vision (diplopia), changes in colour perception, restriction of visual fields and blindness. 60-200 ml of methanol is a fatal dose for most adults with as little as 10 ml producing blindness. In massive overdose, liver, kidney, heart and muscle injury have been described.

Symptoms of borate poisoning include nausea, vomiting, diarrhoea, epigastric pain. Vomiting is often persistent and vomitus and faeces may contain blood. Weakness, lethargy, headache, restlessness, tremors and intermittent convulsions may also occur. Toxic symptoms may be delayed for several hours. The borates (tetra-, di-, meta, or ortho-salts, in contrast to perborates) once solubilised in the acid of gastric juices, cannot be distinguished from each other on chemical or toxicological grounds. In adults the mean lethal dose of sodium borate or boric acid probably exceeds 30 gms (Gosselin) and death occurs due to vascular collapse in the early stages or to central nervous system depression in later stages. Children are thought to be more susceptible to the effects of borate intoxication. Poisoning produces central nervous system stimulation followed by depression, gastrointestinal disturbance (haemorrhagic gastro-enteritis), erythematous skin eruptions (giving rise to a boiled lobster appearance) and may also involve kidneys (producing oliguria, albuminuria, anuria) and, rarely, liver (hepatomegaly, jaundice). Excretion occurs mainly through the kidneys with about half excreted in the first 12 hours and the remainder over 5-12 days.

##### EYE

Limited evidence exists, or practical experience suggests, that the material may cause eye irritation in a substantial number of individuals and/or is expected to produce significant ocular lesions which are present twenty-four hours or more after instillation into the eye(s) of experimental animals. Repeated or prolonged eye contact may cause inflammation characterised by temporary redness (similar to windburn) of the conjunctiva (conjunctivitis); temporary impairment of vision and/or other transient eye damage/ulceration may occur.

The material may produce moderate eye irritation leading to inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

continued...

# TRIMETHYL BORATE

## SKIN

Skin contact with the material may be harmful; systemic effects may result following absorption.

The material is not thought to be a skin irritant (i.e. is unlikely to produce irritant dermatitis as described in EC Directives using animal models). Temporary discomfort, however, may result from prolonged dermal exposures. Good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting.

The liquid may produce skin discomfort following prolonged contact. Defatting and/or drying of the skin may lead to dermatitis.

Open cuts, abraded or irritated skin should not be exposed to this material.

Toxic effects may result from skin absorption.

## INHALED

Inhalation may produce health damage\*.

The material is not thought to produce respiratory irritation (as classified by EC Directives using animal models). Nevertheless inhalation, of the material, especially for prolonged periods, may produce respiratory discomfort and occasionally, distress.

Inhalation of vapour may aggravate a pre-existing respiratory condition.

Symptoms of poisoning resulting from carbon monoxide exposure include respiratory disorders, diarrhoea and shock. Carbon monoxide competes with oxygen for haemoglobin binding sites and has a 240-fold affinity for these sites compared to oxygen. In addition to oxygen deficiency further disability is produced by the formation of carboxymyoglobin in muscles, to produce disturbances in muscle metabolism, particularly that of the heart. Acute effects from inhalation of high concentrations of vapour are pulmonary irritation, including coughing, with nausea; central nervous system depression - characterised by headache and dizziness, increased reaction time, fatigue and loss of co-ordination.

## CHRONIC HEALTH EFFECTS

Principal routes of exposure are by accidental skin and eye contact and by inhalation of vapours especially at higher temperatures.

No human exposure data available. For this reason health effects described are based on experience with chemically related materials.

As with any chemical product, contact with unprotected bare skin; inhalation of vapour, mist or dust in work place atmosphere; or ingestion in any form, should be avoided by observing good occupational work practice.

## TOXICITY AND IRRITATION

unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

### TOXICITY

Oral (rat) LD50: 6140 mg/kg

Oral (mouse) LD50: 1290 mg/kg

Dermal (rabbit) LD50: 1980 mg/kg

### IRRITATION

Eye (rabbit): 500 mg - Moderate

## METHANOL:

unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

### TOXICITY

Oral (human) LDLo: 143 mg/kg

Oral (man) LDLo: 6422 mg/kg

Oral (man) TDLo: 3429 mg/kg

Oral (rat) LD50: 5628 mg/kg

Inhalation (human) TCLo: 86000 mg/m<sup>3</sup>

Inhalation (human) TCLo: 300 ppm

Inhalation (rat) LC50: 64000 ppm/4h

Dermal (rabbit) LD50: 15800 mg/kg

### IRRITATION

Skin (rabbit): 20 mg/24 h- Moderate

Eye (rabbit): 40 mg- Moderate

Eye (rabbit): 100 mg/24h- Moderate

The material may cause skin irritation after prolonged or repeated exposure and may produce a contact dermatitis (nonallergic). This form of dermatitis is often characterised by skin redness (erythema) and swelling the epidermis. Histologically there

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## Section 11 - TOXICOLOGICAL INFORMATION

may be intercellular oedema of the spongy layer (spongiosis) and intracellular oedema of the epidermis.

BORIC ACID:

unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

### TOXICITY

Oral (woman) LDLo: 200 mg/kg

Oral (rat) LD50: 2660 mg/kg

Inhalation (rat) LCLo: 28 mg/m<sup>3</sup>/4h

Dermal (man) LDLo: 2430 mg/kg

### IRRITATION

Skin (human): 15 mg/3d - I- Mild

## Section 12 - ECOLOGICAL INFORMATION

No data for trimethyl borate.

Refer to data for ingredients, which follows:

METHANOL:

DO NOT discharge into sewer or waterways.

log Kow: -0.82- -0.66

Half-life (hr) air: 427

Half-life (hr) H<sub>2</sub>O surface water: 5.3-64

Henry's atm m<sup>3</sup> /mol: 1.35E-04

BOD 5 if unstated: 0.76-1.12

COD: 1.05-1.50,99%

ThOD: 1.5

BCF: 0.2-10

Toxicity Fish: LC50(96): 11-15mg/L

TLm(48Hr): 8000mg/L (trout)

Toxicity Arthropoda: NOEL 10 g/L/48Hr (Daphnia) [ICI]

BORIC ACID:

Fish LC50 (96hr.) (mg/l): 79- 100

Daphnia magna EC50 (48hr.) (mg/l): 115- 153

## Section 13 - DISPOSAL CONSIDERATIONS

- Consult manufacturer for recycling options and recycle where possible .
- Consult State Land Waste Management Authority for disposal.
- Incinerate residue at an approved site.
- Recycle containers if possible, or dispose of in an authorised landfill.

## Section 14 - TRANSPORTATION INFORMATION



Labels Required: FLAMMABLE LIQUID

HAZCHEM: 2[Y]E

continued...

# TRIMETHYL BORATE

## Section 14 - TRANSPORTATION INFORMATION

### UNDG:

|                                 |      |                |      |
|---------------------------------|------|----------------|------|
| Dangerous Goods Class:          | 3    | Subrisk:       | None |
| UN Number:                      | 2416 | Packing Group: | II   |
| Shipping Name: TRIMETHYL BORATE |      |                |      |

### Air Transport IATA:

|                                 |      |                    |      |
|---------------------------------|------|--------------------|------|
| ICAO/IATA Class:                | 3    | ICAO/IATA Subrisk: | None |
| UN/ID Number:                   | 2416 | Packing Group:     | II   |
| Special provisions:             | None |                    |      |
| Shipping Name: TRIMETHYL BORATE |      |                    |      |

### Maritime Transport IMDG:

|                                 |            |                     |      |
|---------------------------------|------------|---------------------|------|
| IMDG Class:                     | 3          | IMDG Subrisk:       | None |
| UN Number:                      | 2416       | Packing Group:      | II   |
| EMS Number:                     | F- E, S- D | Special provisions: | None |
| Shipping Name: TRIMETHYL BORATE |            |                     |      |

## Section 15 - REGULATORY INFORMATION

### REGULATIONS

trimethyl borate (CAS: 121-43-7) is found on the following regulatory lists;  
OECD Representative List of High Production Volume (HPV) Chemicals

## Section 16 - OTHER INFORMATION

### INGREDIENTS WITH MULTIPLE CAS NUMBERS

| Ingredient Name | CAS                                      |
|-----------------|------------------------------------------|
| boric acid      | 10043- 35- 3, 11113- 50- 1, 41685- 84- 1 |

### REPRODUCTIVE HEALTH GUIDELINES

Established occupational exposure limits frequently do not take into consideration reproductive end points that are clearly below the thresholds for other toxic effects. Occupational reproductive guidelines (ORGs) have been suggested as an additional standard. These have been established after a literature search for the reproductive no-observed-adverse effect-level (NOAEL) and the lowest-observed-adverse-effect-level (LOAEL). In addition the US EPA's procedures for risk assessment for hazard identification and dose-response assessment as applied by NIOSH were used in the creation of such limits. Uncertainty factors (UFs) have also been incorporated.

| Ingredient | ORG                   | UF  | Endpoi<br>nt | CR | Adeq<br>TLV |
|------------|-----------------------|-----|--------------|----|-------------|
| methanol   | 262 mg/m <sup>3</sup> | NA  | NA           | NA | Yes         |
| boric acid | 1.5 mg/m <sup>3</sup> | 100 | R            | NA | -           |

These exposure guidelines have been derived from a screening level of risk assessment and should not be construed as unequivocally safe limits. ORGS represent an 8-hour time-weighted average unless specified otherwise.

CR = Cancer Risk/10000; UF = Uncertainty factor:

TLV believed to be adequate to protect reproductive health:

LOD: Limit of detection

Toxic endpoints have also been identified as:

# TRIMETHYL BORATE

D = Developmental; R = Reproductive; TC = Transplacental carcinogen  
Jankovic J., Drake F.: A Screening Method for Occupational Reproductive  
American Industrial Hygiene Association Journal 57: 641-649 (1996).

The above information is believed to be accurate and represent the best information currently available to us, but does not represent any warranty expressed or implied of the properties of the product. User should make their own investigation to determine the suitability of the information for their particular purpose.

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