

## Material Safety Data Sheet

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Version 1.2

According to 91/155/EEC

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1 - Product and Company Information

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Product Name	BORIC ACID, 99.5+%, A.C.S. REAGENT
Product Number	236462
Company	Sigma-Aldrich Pte Ltd #08-01 Citilink Warehouse Singapore 118529 Singapore
Technical Phone #	65 271 1089
Fax	65 271 1571

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2 - Composition/Information on Ingredients

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Product Name	CAS #	EC no	Annex I Index Number
BORIC ACID	10043-35-3	233-139-2	None
Formula	H3BO3		
Molecular Weight	61.83 AMU		
Synonyms	Basilit B * Boracic acid * Borofax * Boron trihydroxide * Borsauere (German) * Dr.'s 1 Flea Terminator DF * Dr.'s 1 Flea Terminator DFPBO * Dr.'s 1 Flea Terminator DT * Dr.'s 1 Flea Terminator DTPBO * Flea Prufe * NCI-C56417 * Orthoboric acid * Super Flea Eliminator * Three elephant * Trihydroxyborone		

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3 - Hazards Identification

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SPECIAL INDICATION OF HAZARDS TO HUMANS AND THE ENVIRONMENT  
Not hazardous according to Directive 67/548/EC.

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4 - First Aid Measures

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## AFTER INHALATION

If inhaled, remove to fresh air. If breathing becomes difficult, call a physician.

## AFTER SKIN CONTACT

In case of contact, immediately wash skin with soap and copious amounts of water.

## AFTER EYE CONTACT

In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

## AFTER INGESTION

If swallowed, wash out mouth with water provided person is conscious. Call a physician.

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## 5 - Fire Fighting Measures

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### EXTINGUISHING MEDIA

Suitable: Water spray. Carbon dioxide, dry chemical powder, or appropriate foam.

### SPECIAL RISKS

Specific Hazard(s): Emits toxic fumes under fire conditions.

### SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS

Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

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## 6 - Accidental Release Measures

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### PROCEDURE(S) OF PERSONAL PRECAUTION(S)

Exercise appropriate precautions to minimize direct contact with skin or eyes and prevent inhalation of dust.

### METHODS FOR CLEANING UP

Sweep up, place in a bag and hold for waste disposal. Avoid raising dust. Ventilate area and wash spill site after material pickup is complete.

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## 7 - Handling and Storage

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### HANDLING

Directions for Safe Handling: Avoid inhalation. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure.

### STORAGE

Conditions of Storage: Keep tightly closed.

SPECIAL REQUIREMENTS: Moisture sensitive.

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## 8 - Exposure Controls / Personal Protection

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### ENGINEERING CONTROLS

Safety shower and eye bath. Mechanical exhaust required.

### GENERAL HYGIENE MEASURES

Wash thoroughly after handling.

### PERSONAL PROTECTIVE EQUIPMENT

Respiratory Protection: Wear dust mask.

Hand Protection: Protective gloves.

Eye Protection: Chemical safety goggles.

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## 9 - Physical and Chemical Properties

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Appearance

Physical State: Solid

Property

Value

At Temperature or Pressure

pH

5.1

Concentration: 1.8 g/l

BP/BP Range

300 °C

MP/MP Range

160 °C

Flash Point

N/A

Flammability

N/A

Autoignition Temp

N/A

Oxidizing Properties

N/A

Explosive Properties	N/A	
Explosion Limits	N/A	
Vapor Pressure	2.6 mmHg	20 °C
SG/Density	1.44 g/cm3	
Partition Coefficient	N/A	
Viscosity	N/A	
Vapor Density	N/A	
Saturated Vapor Conc.	N/A	
Evaporation Rate	N/A	
Bulk Density	N/A	
Decomposition Temp.	N/A	
Solvent Content	N/A	
Water Content	N/A	
Surface Tension	N/A	
Conductivity	N/A	
Miscellaneous Data	N/A	
Solubility	Solubility in Water:Soluble.	

## 10 - Stability and Reactivity

### STABILITY

Stable: Stable.

Conditions to Avoid: Moisture.

Materials to Avoid: Potassium, Acid anhydrides.

### HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Boron oxides.

### HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

## 11 - Toxicological Information

RTECS NUMBER: ED4550000

### ACUTE TOXICITY

LDLO

Oral

Man

429 mg/kg

Remarks: Cardiac:Other changes. Kidney, Ureter, Bladder:Changes in tubules (including acute renal failure, acute tubular necrosis).

LDLO

Oral

Woman

200 mg/kg

Remarks: Behavioral:Fluid intake.

Gastrointestinal:Hypermotility, diarrhea.

Gastrointestinal:Nausea or vomiting.

LDLO

Oral

Infant

934 mg/kg

LDLO

Skin

Infant

1200 mg/kg

Remarks: Behavioral:Convulsions or effect on seizure threshold.  
Skin and Appendages:Skin: After systemic exposure: Dermatitis,  
other Nutritional and Gross Metabolic:Changes in:Body  
temperature increase.

LDLO  
Skin  
Child  
4000 mg/kg  
4D

LDLO  
Skin  
Man  
2430 mg/kg  
Remarks: Gastrointestinal:Hypermotility, diarrhea. Skin and  
Appendages:Skin: After topical exposure:Primary irritation.  
Nutritional and Gross Metabolic:Changes in:Body temperature  
increase.

LDLO  
Skin  
Child  
1500 mg/kg  
Remarks: Sense Organs and Special Senses (Nose, Eye, Ear, and  
Taste):Eye:Conjunctive irritation. Lungs, Thorax, or  
Respiration:Respiratory depression.  
Gastrointestinal:Hypermotility, diarrhea.

LDLO  
Subcutaneous  
Infant  
1100 MG/KG  
Remarks: Behavioral:Tremor. Gastrointestinal:Hypermotility,  
diarrhea. Gastrointestinal:Nausea or vomiting.

LD50  
Oral  
Rat  
2660 mg/kg

LD50  
Subcutaneous  
Rat  
1400 MG/KG  
Remarks: Behavioral:Somnolence (general depressed activity).  
Behavioral:Ataxia. Nutritional and Gross Metabolic:Changes  
in:Body temperature decrease.

LD50  
Intravenous  
Rat  
1330 MG/KG  
Remarks: Behavioral:Tremor. Gastrointestinal:Hypermotility,  
diarrhea. Gastrointestinal:Nausea or vomiting.

LD50  
Oral  
Mouse  
3450 mg/kg

LD50

Subcutaneous  
Mouse  
1740 MG/KG

LD50  
Intravenous  
Mouse

1240 MG/KG

Remarks: Behavioral:Convulsions or effect on seizure threshold.  
Lungs, Thorax, or Respiration:Respiratory depression.  
Gastrointestinal:Hypermotility, diarrhea.

LD50  
Subcutaneous  
Guinea pig  
1200 MG/KG

Remarks: Behavioral:Tremor. Gastrointestinal:Hypermotility,  
diarrhea. Gastrointestinal:Nausea or vomiting.

#### IRRITATION DATA

Skin  
Human  
15 mg  
3D

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Remarks: Mild irritation effect

#### SIGNS AND SYMPTOMS OF EXPOSURE

Toxicity reported for borates in humans: ingestion or absorption may cause nausea, vomiting, diarrhea, abdominal cramps, and erythematous lesions on the skin and mucous membranes. Other symptoms include: circulatory collapse, tachycardia, cyanosis, delirium, convulsions, and coma. Death has been reported to occur in infants from less than 5 grams and in adults from 5 to 20 grams.

#### ROUTE OF EXPOSURE

Skin Contact: May cause skin irritation.  
Skin Absorption: May be harmful if absorbed through the skin.  
Eye Contact: May cause eye irritation.  
Inhalation: May be harmful if inhaled. Material may be irritating to mucous membranes and upper respiratory tract.  
Ingestion: May be harmful if swallowed.

#### TARGET ORGAN INFORMATION

Testes.

#### CHRONIC EXPOSURE - TERATOGEN

Result: Laboratory experiments have shown teratogenic effects.

Species: Rat  
Dose: 1600 MG/KG  
Route of Application: Oral  
Exposure Time: (6-9D PREG)  
Result: Specific Developmental Abnormalities: Musculoskeletal system.

Species: Rat  
Dose: 6600 MG/KG  
Route of Application: Oral  
Exposure Time: (1-21D PREG)

Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Specific Developmental Abnormalities: Musculoskeletal system. Specific Developmental Abnormalities: Other developmental abnormalities.

Species: Rat

Dose: 1596 MG/KG

Route of Application: Oral

Exposure Time: (0-20D PREG)

Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Specific Developmental Abnormalities: Musculoskeletal system.

Species: Mouse

Dose: 7684 MG/KG

Route of Application: Oral

Exposure Time: (1-17D PREG)

Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Species: Mouse

Dose: 800 MG/KG

Route of Application: Oral

Exposure Time: (7D PREG)

Result: Specific Developmental Abnormalities: Musculoskeletal system.

Species: Rabbit

Dose: 3500 MG/KG

Route of Application: Oral

Exposure Time: (6-19D PREG)

Result: Effects on Embryo or Fetus: Fetal death. Specific Developmental Abnormalities: Cardiovascular (circulatory) system.

Species: Rabbit

Dose: 3500 MG/KG

Route of Application: Oral

Exposure Time: (6-19D PREG)

Result: Specific Developmental Abnormalities: Craniofacial (including nose and tongue). Specific Developmental Abnormalities: Other developmental abnormalities.

#### CHRONIC EXPOSURE - REPRODUCTIVE HAZARD

Result: May cause reproductive disorders.

Species: Rat

Dose: 45 GM/KG

Route of Application: Oral

Exposure Time: (90D MALE)

Result: Paternal Effects: Testes, epididymis, sperm duct.

Species: Rat

Dose: 5390 MG/KG

Route of Application: Oral

Exposure Time: (6-15D PREG)

Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants). Effects on Embryo or Fetus: Fetal death. Specific Developmental Abnormalities: Musculoskeletal system.

Species: Rat

Dose: 52 MG/KG

Route of Application: Oral  
Exposure Time: (26W MALE)  
Result: Paternal Effects: Spermatogenesis (including genetic material, sperm morphology, motility, and count).

Species: Rat  
Dose: 9600 UG/M3/4H  
Route of Application: Inhalation  
Exposure Time: (16W MALE)  
Result: Paternal Effects: Spermatogenesis (including genetic material, sperm morphology, motility, and count). Paternal Effects: Testes, epididymis, sperm duct.

Species: Mouse  
Dose: 17051 MG/KG  
Route of Application: Oral  
Exposure Time: (1-17D PREG)  
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species: Mouse  
Dose: 18054 MG/KG  
Route of Application: Oral  
Exposure Time: (1-18D PREG)  
Result: Maternal Effects: Uterus, cervix, vagina. Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species: Mouse  
Dose: 8136 MG/KG  
Route of Application: Oral  
Exposure Time: (1-18D PREG)  
Result: Maternal Effects: Other effects. Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Species: Rabbit  
Dose: 3500 MG/KG  
Route of Application: Oral  
Exposure Time: (6-19D PREG)  
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants). Effects on Fertility: Litter size (e.g.; # fetuses per litter; measured before birth). Specific Developmental Abnormalities: Cardiovascular (circulatory) system.

Species: Rabbit  
Dose: 3500 MG/KG  
Route of Application: Oral  
Exposure Time: (7-20D PREG)  
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants). Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Specific Developmental Abnormalities: Musculoskeletal system.

Species: Rabbit  
Dose: 1750 MG/KG  
Route of Application: Oral  
Exposure Time: (7-20D PREG)  
Result: Maternal Effects: Uterus, cervix, vagina. Maternal Effects: Other effects.

## 12 - Ecological Information

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N/A

### ECOTOXICOLOGICAL EFFECTS

Test Type: EC50 Daphnia

Species: Daphnia magna

Time: 48 h

Value: 133 mg/l

Test Type: LC0 Fish

Species: Lepomis macrochirus (Bluegill)

Time: 96 h

Value: > 1,021 mg/l

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## 13 - Disposal Considerations

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### SUBSTANCE DISPOSAL

Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state, and local environmental regulations.

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## 14 - Transport Information

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### RID/ADR

Non-hazardous for road transport.

### IMDG

Non-hazardous for sea transport.

### IATA

Non-hazardous for air transport.

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## 15 - Regulatory Information

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Not hazardous according to Directive 67/548/EC.

### COUNTRY SPECIFIC INFORMATION

#### Germany

WGK: 1

#### SWITZERLAND

SWISS POISON CLASS: 4

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## 16 - Other Information

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### WARRANTY

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. Copyright 2004 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.



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