

SAFETY DATA SHEET POTASSIUM PENTABORATE

SECTION 1 : CHEMICAL PRODUCT AND COMPANY IDENTIFICATION		
Product Name	:POTASSIUM PENTABORATE	
SYNONYMS	: Potassium pentaborate tetrahydrate	
CAS No	: 12229-13-9	
Chemical Designation	: KB5O8·4H2O	
Molecular Weight	: 586.43 g/mole	
General Use	: Industrial / Chemical Manufacturing / Use in agriculture in liquid and powder fertilizer production. Due to the particular potassium and boron are rich in both liquid dripping leaf fertilizer used in fertilizers	
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SECTION 2 : HAZARDS IDENTIFICATION

Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008

Reproductive toxicity (Category 2), H361d

Label elements

Labelling according Regulation (EC) No 1272/2008

Pictogram



Signal word

Warning



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Hazard statement(s)
H361d

Suspected of damaging the unborn child.

Precautionary statement(s)
P281

Use personal protective equipment as required.

Supplemental Hazard
Statements

none

Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

SECTION 3 : COMPOSITION/INFORMATION ON INGREDIENT

Composition:

Name	CAS #	% by Weight
Potassium pentaborate	12229-13-9	100

OSHA Hazard Communication Standard: This product is considered hazardous under the OSHA Hazard Communication Standard

SECTION 4 : FIRST AID MEASURES

Inhalation: If symptoms such as nose or throat irritation are observed, remove person to fresh air.

Eye contact: Use eye wash fountain or fresh water to cleanse the eye. If irritation persists for more than 30 minutes, seek medical attention.

Skin contact: No treatment necessary because non-irritating.

Ingestion: Swallowing small quantities (one teaspoon) will cause no harm to healthy adults. If larger amounts are swallowed, give two glasses of water to drink and seek medical attention.

Note to physicians*: Observation only is required for adult ingestion in the range of 4-8 grams of Potassium Pentaborate. For ingestion of larger amounts, maintain adequate kidney function and force fluids. Gastric lavage is recommended for symptomatic patients only. Hemodialysis should be reserved for massive acute ingestion or patients with renal failure. Boron analyses of urine or blood are only useful for documenting exposure and should not be used to evaluate severity of poisoning or to guide treatment¹.



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SECTION 5 : FIRE-FIGHTING MEASURES

General hazard: None, because Potassium Pentaborate is not flammable, combustible or explosive. The product is itself a flame retardant.

Extinguishing media: Any fire extinguishing media may be used on nearby fires.

Flammability classification (29 CFR 1910.1200): Nonflammable solid.

SECTION 6 : ACCIDENTAL RELEASE MEASURES

General: Potassium Pentaborate is a water-soluble, white powder that may, at high concentrations, cause damage to trees or vegetation by root absorption. (Refer to Ecological information, Section 12, for specific information.)

Land spill: Vacuum, shovel or sweep up Potassium Pentaborate and place in containers for disposal in accordance with applicable local regulations. Avoid contamination of water bodies during cleanup and disposal. Personal protective equipment is not needed to clean up land spills.

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. (Refer to Sections 12, 13 and 15 for additional information.) Potassium Pentaborate is a non-hazardous waste when spilled or disposed of, as defined in the Resource Conservation and Recovery Act (RCRA) regulations (40 CFR 261). (Refer to Regulatory information, Section 15, for additional references.)

SECTION 7 : HANDLING AND STORAGE

STORAGE
PRECAUTIONS

Store in a cool, dry place away from strong acids or alkalis. Do not use glass, porcelain or other siliceous materials as storage vessel

HANDLING
PRECAUTIONS

Wear protective clothing, impervious gloves, goggles

SPILL OR LEAK
PROCEDURE

Salvage material into an appropriate disposal drum / carboy.
Wash the spilled air with water or water mixed with alkali.



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SECTION 8 : EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering controls: Use local exhaust ventilation to keep airborne concentrations of Potassium Pentaborate dust below permissible exposure levels.

Personal protection: Where airborne concentrations are expected to exceed exposure limits, NIOSH/MSHA certified respirators should be used. Eye goggles and gloves are not required for normal industrial exposures, but may be warranted if environment is excessively dusty.

Occupational exposure limits: Potassium pentaborate tetrahydrate (Potassium Pentaborate) is treated by OSHA, Cal OSHA and ACGIH as "Particulate Not Otherwise Classified" or "Nuisance Dust".

ACGIH/TLV: 10 mg/m³

Cal OSHA/PEL: 10 mg/m³

OSHA/PEL (total dust): 15 mg/m³

OSHA/PEL (respirable dust): 5 mg/m³

SECTION 9 : PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE	White odorless, crystalline solid
SPECIFIC GRAVITY	1.74
MELTING POINT	780°C (1436°F)
SOLUBILITY IN WATER	4.4% BY WT @ 25°C
FLAST POINT	N/A
EXPLOSION LIMITS	N/A

SECTION 10 : STABILITY AND REACTIVITY

CHEMICAL STABILITY	Stable under normal temperatures and pressures
CONDITIONS TO AVOID	Incompatible materials
INCOMPATIBILITIES WITH OTHER MATERIALS	Strong oxidizing agents, strong acids
HAZARDOUS DECOMPOSITION PRODUCTS	None known



SECTION 11 : TOXICOLOGICAL INFORMATION

Acute toxicity

Ingestion: Low acute oral toxicity; LD50 in rats is calculated to be 2800 mg/kg of body weight (based on potassium tetraborate tetrahydrate experimental data).

Skin/dermal: No experimental data. LD50 is expected to be greater than 2,000 mg/kg of body weight. Potassium Pentaborate is poorly absorbed through intact skin.

Inhalation: No experimental data. Other borates indicate low acute inhalation toxicity. Many years of occupational exposure to boric acid and other borates indicate no increase in pulmonary disease.

Skin irritation: No experimental test data. Similar potassium and sodium borate substances are non-irritants.

Eye irritation: No experimental test data. Eye irritation seen in rabbits treated with sodium tetraborates. Many years of occupational exposure to sodium and potassium borate products indicate no adverse effects on human eye. Therefore, Potassium Pentaborate is not considered to be a human eye irritant in normal industrial use.

Sensitization: Potassium Pentaborate is not a skin sensitizer

Other

Reproductive/developmental toxicity: Animal feeding studies in rat, mouse and dog, at high doses, have demonstrated effects on fertility and testes². Studies with the chemically related boric acid in the rat, mouse and rabbit, at high doses, demonstrate developmental effects on the fetus, including fetal weight loss and minor skeletal variations^{3, 4}. The doses administered were many times in excess of those to which humans would normally be exposed.

Carcinogenicity/mutagenicity: Boric acid did not produce any evidence of carcinogenicity in mice⁶, nor was any mutagenic activity observed in a battery of short-term mutagenicity assays.

Human data: 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

SECTION 12 : ECOLOGICAL INFORMATION

Ecotoxicity data

General: Boron (B) is the element in potassium pentaborate tetrahydrate (Potassium Pentaborate) which is used by convention to report borate product ecological effects. It occurs naturally in seawater at an average concentration of 5 mg B/L and generally occurs in freshwater at concentrations up to 1 mg B/L. In dilute aqueous solutions the predominant boron species present is undissociated boric acid. To convert potassium pentaborate tetrahydrate into the equivalent boron (B) content, multiply by 0.1843.

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 minimize the amount of Potassium Pentaborate released to the environment



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Environmental fate data

Persistence/degradation: Boron is naturally occurring and ubiquitous in the environment. Potassium Pentaborate decomposes in the environment to natural borate.

Octanol/water partition coefficient: No value. In aqueous solution potassium pentaborate tetrahydrate is converted substantially into undissociated boric acid.

Soil mobility: Potassium Pentaborate is soluble in water and is leachable through normal soil.

SECTION 13 : DISPOSAL CONSIDERATIONS

Disposal guidance: Small quantities of Potassium Pentaborate 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 should, if possible, be used for an appropriate application.

RCRA (40 CFR 261): Potassium Pentaborate is not listed under any sections of the Federal Resource Conservation and Recovery Act (RCRA).

NPRI (Canada): Potassium Pentaborate is not listed on the Canadian National Pollutant Release Inventory.

SECTION 14 : TRANSPORT INFORMATION

DOT hazardous classification: Potassium Pentaborate is not regulated by the U.S. Department of Transportation (DOT) and is therefore not considered a hazardous material/substance

TDG Canadian transportation: Potassium Pentaborate is not regulated under Transportation of Dangerous Goods (TDG).

International transportation: Potassium Pentaborate has no UN Number, and is not regulated under international rail, road, water or air transport regulations.

SECTION 15 : REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture

This safety datasheet complies with the requirements of Regulation (EC) No. 1907/2006.

Chemical safety assessment

For this product a chemical safety assessment was not carried out



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SECTION 16 : OTHER INFORMATION

References: Not available

Other Special Considerations: Not available

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