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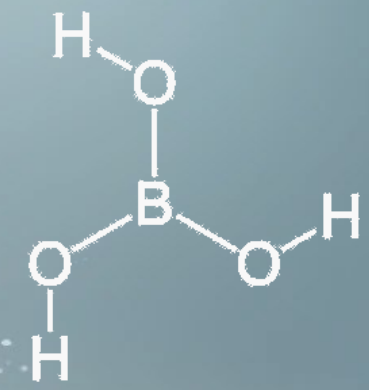
H_3BO_3

99.6%
CAS NO. 10043-35-3
INDUSTRIAL GRADE
According to GB/T 538-2018



BORIC ACID

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BORIC ACID

APPLICATIONS

- AGRICULTURE
- PEST CONTROL
- MEDICAL AND HEALTH
- INDUSTRIAL AND MANUFACTURING
- CHEMICAL APPLICATIONS
- METALLURGICAL APPLICATIONS

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BORIC ACID - APPLICATION

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Mechanism of Action of Boric Acid in Agriculture

1. Micronutrient Source

Boric acid provides essential boron, a micronutrient crucial for the growth and health of plants. Boron plays a vital role in cell wall formation, flowering, fruiting, and seed development. It helps in the transport of sugars and nutrients and is necessary for the regulation of hormone levels within plants. By supplying boron, boric acid ensures proper plant development and improved crop yield.

2. Disease Control

As a fungicide, boric acid is effective against various fungal diseases, such as powdery mildew in grapes and other crops. It disrupts the growth of fungi by interfering with their cellular processes, preventing the spread of infection and reducing crop damage. This use is particularly important in vineyards and orchards where fungal infections can significantly impact productivity.

3. Soil Conditioner

Boric acid can be used to amend soils that are deficient in boron. Proper boron levels are essential for optimal plant growth and health. By conditioning the soil with boric acid, farmers can correct boron deficiencies, enhancing soil quality and enabling plants to thrive and absorb nutrients more effectively.

4. Herbicide Potential

Research continues into the use of boric acid as a selective herbicide. It can control weeds by disrupting their growth at critical development stages, specifically those sensitive to boron. This approach can be particularly effective in managing weed populations in crops that require precise boron levels, thereby reducing competition for nutrients between the crops and weeds.

5. Plant Growth Regulator

Boric acid influences plant growth rates and developmental processes. It is involved in the development of the plant's reproductive structures, such as pollen tubes and flowers. By regulating boron levels with boric acid, farmers can influence the timing of flowering, fruit set, and ultimately, the yield and quality of the harvest.

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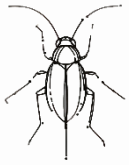

BORIC ACID - APPLICATION

Mechanism of Action of Boric Acid in Pest Control

1. Residential Insecticide

Boric acid acts as a stomach poison when ingested by insects such as ants, cockroaches, and silverfish. It interferes with their digestive systems, ultimately leading to their starvation. Moreover, boric acid has abrasive properties that damage the exoskeleton of these pests, causing them to dehydrate and die. The powder form of boric acid is particularly effective as it sticks to the legs and bodies of insects, who then ingest it when grooming.

2. Agricultural Pest Control

In agriculture, boric acid is applied to crops in the form of sprays or powders to control a variety of pests that threaten crop health. Its action is twofold: it acts as a stomach poison affecting the metabolism of pests when ingested, and it disrupts their exoskeletons leading to dehydration. This method is considered environmentally friendly as it breaks down naturally without leaving harmful residues, making it safer than many synthetic pesticides.

3. Termite Treatment

For termite control, boric acid is either impregnated into wood or applied as a solution around wooden structures. When termites ingest the boric acid-treated wood or come into contact with it, it disrupts their digestive enzymes and metabolic pathways, leading to starvation and death. This treatment is long-lasting and less toxic compared to traditional termite pesticides, offering an effective preventive measure against termite infestation.

4. Garden Safety

Boric acid is used in gardens to manage pests like snails and slugs without harming the plants. It is mildly toxic to these pests and works primarily through contact and ingestion. When snails and slugs crawl over an area treated with boric acid, it sticks to their bodies. As they attempt to clean it off, they ingest it, which leads to dehydration and metabolic disturbances, effectively reducing their population in gardens.

5. Long-lasting Effects

One of the key advantages of using boric acid for pest control is its persistence. Unlike many pesticides that degrade quickly under environmental conditions, boric acid remains effective for long periods when not washed away by rain or irrigation. This sustained action makes it a cost-effective and efficient choice for long-term pest management, as it continues to control new generations of pests that come into contact with the treated areas.

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BORIC ACID - APPLICATION

Mechanism of Action of Boric Acid in Medical and Health Uses

1. Antiseptic for Wounds

Boric acid acts as a broad-spectrum bactericide and fungicide. When applied to wounds, it helps prevent or control bacterial and fungal infections by creating an inhospitable environment for these microorganisms. It disrupts the growth and reproduction of bacteria and fungi, effectively reducing infection risks and promoting healing.

2. Ophthalmic Solution

In ophthalmic preparations, boric acid is used for its soothing and antibacterial properties. It helps maintain an appropriate pH balance in the eye, providing comfort and reducing irritation. Additionally, boric acid helps inhibit the growth of bacteria and fungi that can cause eye infections, making it a common ingredient in eyewashes and drops.

3. pH Management in Pharmaceuticals

Boric acid is utilized to stabilize pH in various pharmaceutical formulations. This stabilization is crucial because it ensures the chemical stability and efficacy of the medication. A stable pH can affect the shelf life, safety, and effectiveness of pharmaceutical products, helping to maintain the intended therapeutic impact over time.

4. Antifungal Agent

As an antifungal agent, boric acid is particularly effective against Candida species, which are common culprits behind yeast infections, including vaginal yeast infections and skin infections like athlete's foot. Boric acid alters the environment of the fungus, disrupting its enzymatic and metabolic processes, leading to cell membrane failure and fungal death.

5. Preservative in Medications

Boric acid acts as a preservative in certain pharmaceutical products by preventing the growth of microbes that can contaminate and degrade formulations. This use is especially important in products like eye drops, nasal sprays, and some injectable medications where sterility must be maintained to prevent infections.

BORIC ACID - APPLICATION

Mechanism of Action of Boric Acid in Industrial and Manufacturing

1. Glass and Ceramics Manufacturing

In the manufacture of glass and ceramics, boric acid is used to improve the chemical resistance, durability, and thermal stability of the final products. It helps to lower the melting temperature of glass and increase the fluidity of the molten glass, facilitating easier shaping and forming. Additionally, boric acid introduces boron into the glass structure, enhancing its resistance to thermal shock and mechanical stress.

2. Leather Industry

Boric acid is used in the leather tanning process where it acts as a preservative and helps control the pH. This is crucial for preventing bacterial and fungal growth during the soaking and tanning stages of leather production. Its antifungal and antibacterial properties ensure the leather does not spoil or degrade during processing, leading to higher quality and more durable leather products.

3. Photographic Chemicals

In photography, boric acid is used to adjust the pH and buffer solutions in the development process of photographic films and papers. This stability is crucial for ensuring consistent development times and quality of the images. Boric acid helps prevent alkaline or acidic shifts in the developer solution that could lead to undesirable effects on the photographic image.

4. Textile Industry

Applied to textiles, boric acid provides fire resistance. It is often used in the treatment of fabrics that are used in curtains, upholstery, and other household items to meet fire safety standards. The mechanism involves boric acid releasing water when exposed to flame, thereby cooling the material and reducing the availability of oxygen, which is necessary for combustion.

5. Electronics

In the electronics industry, boric acid is used in the production of borosilicate glass which is often used for display panels, including those in smartphones and laptops. Borosilicate glass, enhanced with boric acid, exhibits superior resistance to temperature changes and physical stress, making it ideal for high-tech applications where durability and clarity are crucial.

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BORIC ACID - APPLICATION

Mechanism of Action of Boric Acid in Chemical Applications

1. pH Buffer

Boric acid is an excellent buffering agent, particularly useful for maintaining stable pH levels in solutions. This property is vital in environments where pH fluctuations can lead to undesirable reactions or degradation of products. It works by reacting with strong bases or acids in solution to moderate and maintain the desired pH, which is crucial in various chemical processes, including in pools, cosmetics, and pharmaceuticals.

2. Flame Retardant

As a flame retardant, boric acid works by releasing water molecules when exposed to high temperatures. This release of water helps to cool the material and dilute flammable gases, thus reducing the oxygen available to feed the fire. Additionally, boric acid can form a protective char layer on the material's surface, which helps to block heat and prevent further combustion.

3. Industrial Catalyst

In chemical synthesis, boric acid can act as a catalyst, facilitating various organic reactions, including esterifications and transesterifications. Its mild acidity helps in the transfer of molecules or atoms from one compound to another, speeding up reactions while requiring less energy and producing fewer by-products.

4. Corrosion Inhibitor

Boric acid is used in industrial cooling systems and automotive antifreezes as a corrosion inhibitor. It helps protect metals within these systems by forming a protective coating that resists oxidation and reduces the corrosion rate. This is particularly important in systems where metals need to maintain their integrity over long periods under thermal stress and chemical exposure.

5. Nuclear Chemistry

In nuclear reactors, boric acid plays a crucial role as a neutron absorber, helping to control the rate of nuclear fission. By absorbing neutrons, boric acid helps maintain a controlled nuclear chain reaction, preventing the reactor from overheating and potentially reaching dangerous levels. This use is critical for the safe operation and regulation of nuclear energy production.

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Metallurgical Applications of Boric Acid

1. Flux in Metal Refining

Boric acid is commonly used as a flux during the refining and smelting of metals like gold, silver, and copper. As a flux, boric acid helps to lower the melting points of these metals, reduces oxidation, and cleanses the molten metal of impurities. This facilitates cleaner, more efficient pours and better separation of metal from slag.

2. Improves Alloy Properties

In alloy production, boric acid is added to mixtures of metals to enhance the properties of the resulting alloys. For example, adding boric acid to steel or aluminum alloys can improve their hardness, wear resistance, and fatigue strength. This is particularly valuable in the automotive and aerospace industries, where high-performance materials are crucial.

3. Welding and Soldering Aid

Boric acid is used as a deoxidizer and wetting agent in the welding and soldering of metals. It helps in cleaning metal surfaces to be joined, improving the flow of the solder and reducing the formation of metal oxides during the welding process, which results in stronger, cleaner joints.

4. Corrosion Resistance

When added to metal coatings, boric acid can enhance the corrosion resistance of the coated metals. This application is important in preventing rust and corrosion in metal parts exposed to harsh environments.

5. Nuclear Applications

In metallurgical components used in nuclear reactors, boric acid is added to certain alloys to absorb neutrons and control nuclear reactions. This application is critical for maintaining the safety and efficiency of nuclear power generation.

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ANAYLYSIS REPORT

- TDS & COA
- SVHC TEST
- ROHS TEST
- HALOGEN TEST

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BORIC ACID – ANAYLYSIS REPORT

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TDS & COA

General Description		Origin	
Boric Acid		China	
Grade	E number	Formula	
Industrial grade	-	H_3BO_3	
Molecular weight	EINECS	CAS number	
61.84	233-139-2	10043-35-3	
Melting Point	Boiling Point	Solubility in Water	
170.9 ℃	300.0 ℃	4.7g/100 mL (20 ℃)	
pH Value	Density	Synonyms	
5.1 (0.1 M aqueous solution)	1.44 g/cm^3	Orthoboric acid, Acidum boricum	
Application			
Glass and Ceramics Manufacturing	Metallurgy	Pest Control and Wood Preservation	Corrosion Inhibition
Chemical Manufacturing	Flame Retardants	Agriculture	Pharmaceuticals and Cosmetics

INSPECTION ITEM	UNIT	STANDARD	TEST RESULT
Appearance	/	White crystalline powder	White crystalline powder
Boric Acid	w/%	99.4-100.8	99.9
Water Insoluble	w/%	≤0.040	0.012
Chloride	w/%	≤0.050	0.009
Sulphate	w/%	≤0.20	0.05
Iron	w/%	≤0.0015	0.0010
Heavy Metal (As Pb)	w/%	/	0.001
Arsenic (As)	w/%	/	0.000006
Mercury (Hg)	w/%	/	N.D (RL 0.0001ug/L)
Chromium (Cr)	w/%	/	0.0003
Cadmium (Cd)	w/%	/	0.0001
Particle size (40-120 mesh)	w/%	/	81.1
Particle size ((+40 mesh)	w/%	/	8.26
Particle size (-120 mesh)	w/%	/	10.64
Inspection Standard	According to GB/T 538-2018		
Batch No.	20240303	Date of Sampling	20240303
Date of Production	20240303	Date of Test	20240303

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BORIC ACID – ANAYLYSIS REPORT

SVHC TEST

Batch No.	Serial No.	Substance	CAS No	Method detection limit	RL (%)
III	30	Boric Acid	10043-35-3 11113-50-1	99.92	0.01
III	31	Anhydrous Borax	1330-43-4 12179-04-3 1303-96-4	N.D.	0.01
III	32	Borax, hydrated compound	12267-73-1	N.D.	0.01
VII	74	Diboron Trioxide (B2O3)	1303-86-2	N.D.	0.01
XI	154	Sodium perborate, hydrated compound; Sodium perborate salt	15120-21-5 11138-47-9	N.D.	0.01
XI	155	Sodium perborate, anhydrous	7632-04-4	N.D.	0.01
XIX	186	Disodium octaborate	12008-41-2	N.D.	0.01
XXV	218	Sodium borate salt	13840-56-7	N.D.	0.01
XXVIII	228	Barium metaborate	13701-59-2	N.D.	0.01
-	-	Other SVHC substances (see candidate list)	-	N.D.	-
-	-	All Intentions/Potential Intentions SVHC Substances (see list of intended/ potential intended SVHC substances)	-	N.D.	-

- Referring to Regulation (EC) No 1907/2006 (REACH), screening tests were conducted for 240 Substances of Very High Concern (SVHC) in the submitted samples.
- Screening tests were also conducted for one candidate substance, which was proposed on June 1, 2021, by the Member States to the European Chemicals Agency (ECHA) to become an SVHC under Regulation (EC) No 1907/2006 (REACH).
- Screening tests were conducted for 8 potential candidate SVHC substances.
- Testing basis: Sample pre-treatment according to US EPA3052:1996, US EPA 3050B:1996, US EPA3060A:1996, US EPA 3550C:2007, US EPA 3540C:1996, ISO 17353:2004(E), EN 14582:2016. Analyses were performed using ICP-OES, UV- Vis, PLM, SEM, IC, HPLC, GC-MS, GC-MS(NCI), GC-FID, HPLC-DAD, and LC-MS-MS.

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BORIC ACID – ANAYLYSIS REPORT

ROHS TEST

Inspection Items	Result	Method detection limit	RL (%)
Lead (Pb)	N.D.	2 mg/kg	1000 mg/kg
Cadmium (Cd)	N.D.	2 mg/kg	100 mg/kg
Mercury (Hg)	N.D.	2 mg/kg	1000 mg/kg
Hexavalent chromium (Cr(VI))	N.D.	8 mg/kg	1000 mg/kg
Polybrominated biphenyls (PBBs)			
Monobromobiphenyl	N.D.	5 mg/kg	
Dibromobiphenyl	N.D.	5 mg/kg	
Tribromobiphenyl	N.D.	5 mg/kg	
Tetrabromobiphenyl	N.D.	5 mg/kg	
Pentabromobiphenyl	N.D.	5 mg/kg	
Hexabromobiphenyl	N.D.	5 mg/kg	1000 mg/kg
Heptabromobiphenyl	N.D.	5 mg/kg	
Octabromobiphenyl	N.D.	5 mg/kg	
Nonabromobiphenyl	N.D.	5 mg/kg	
Decabromobiphenyl	N.D.	5 mg/kg	
Polybrominated diphenyl ethers (PBDEs)			
Monobromodiphenyl ether	N.D.	5 mg/kg	
Dibromodiphenyl ether	N.D.	5 mg/kg	
Tribromodiphenyl ether	N.D.	5 mg/kg	
Tetrabromodiphenyl ether	N.D.	5 mg/kg	
Pentabromodiphenyl ether	N.D.	5 mg/kg	
Hexabromodiphenyl ether	N.D.	5 mg/kg	1000 mg/kg
Heptabromodiphenyl ether	N.D.	5 mg/kg	
Octabromodiphenyl ether	N.D.	5 mg/kg	
Nonabromodiphenyl ether	N.D.	5 mg/kg	
Decabromodiphenyl ether	N.D.	5 mg/kg	
Phthalates (DBP, BBP, DEHP, DIBP)			
Diisobutyl phthalate (DIBP) CAS:84-69-5	N.D.	50 mg/kg	1000 mg/kg
Dibutyl phthalate (DBP) CAS :84-74-2	N.D.	50 mg/kg	1000 mg/kg
Butyl benzyl phthalate (BBP) CAS :85-68-7	N.D.	50 mg/kg	1000 mg/kg
Di(2-ethyl)hexyl phthalate (DEHP) CAS :117-81-7	N.D.	50 mg/kg	1000 mg/kg

BORIC ACID – ANAYLYSIS REPORT

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Basis of Testing

Items	Methods	Instruments
Lead (Pb)	IEC 62321-5:2013	ICP-OES
Cadmium (Cd)	IEC 62321-5:2013	ICP-OES
Mercury (Hg)	IEC 62321-4:2013+AMD1:2017 CSV	ICP-OES
Hexavalent chromium (Cr(VI))	IEC 62321-7-2:2017 and/or IEC 62321-5:2013 Testing for Total Chromium	UV-Vis/ICP-OES
Polybrominated biphenyls (PBBs)	IEC 62321-6:2015	GC-MS
Polybrominated diphenyl ethers (PBDEs)	IEC 62321-6:2015	GC-MS
Phthalates (DBP, BBP, DEHP, DIBP)	IEC 62321-8:2017	GC-MS

Basis of Standard/Directive: EU RoHS Directive 2011/65/EU and its amending directive (EU) 2015/863.
Conclusion: The test results comply with the limits required by the EU RoHS Directive 2011/65/EU and its amending directive (EU) 2015/863.

HALOGEN TEST

Inspection Items	Result	Method detection limit
Fluorine (F)	N.D.	10 mg/kg
Chlorine (Cl)	N.D.	10 mg/kg
Bromine (Br)	N.D.	10 mg/kg
Iodine (I)	N.D.	10 mg/kg

Basis of Testing

Item	Method	Instrument
Fluorine (F)	Reference: EN 14582:2016	IC
Chlorine (Cl)	Reference: EN 14582:2016	IC
Bromine (Br)	Reference: EN 14582:2016	IC
Iodine (I)	Reference: EN 14582:2016	IC

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PACKAGING AND LOADING

- PACKAGE 20KG/50KG
- LOADING CAPACITY

BORIC ACID

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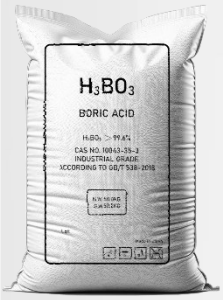
BORIC ACID – PACKAGE

PACKAGE	25KG	50KG
LOADING CAPACTIY /20GP FCL	WITHOUT PALLET	
	23.75 MT	
	WITH PALLETS	
	20 MT	17.50 MT

Sunlite Package	Neutral English package
 	 

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