

ALFAA43502

## 1-Hydroxyethylidenebis(phosphonic acid)

### SECTION 1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

产品说明: 乙烷-1-羟基-1,1-二磷酸  
Product Description: 1-Hydroxyethylidenebis(phosphonic acid)

Cat No. : 43502  
CAS No 2809-21-4  
Molecular Formula CH<sub>3</sub> C(OH)(PO<sub>3</sub> H<sub>2</sub>)<sub>2</sub>

Supplier Avocado Research Chemicals Ltd.  
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Recommended Use Laboratory chemicals.  
Uses advised against No Information available

### SECTION 2. HAZARD IDENTIFICATION

**Physical State**  
Solid

**Appearance**  
No information available

**Odor**  
Odorless

**Emergency Overview**  
May be harmful if swallowed. Causes severe skin burns and eye damage.

#### Classification of the substance or mixture

|                                   |              |
|-----------------------------------|--------------|
| Acute Oral Toxicity               | Category 5   |
| Skin Corrosion/Irritation         | Category 1 B |
| Serious Eye Damage/Eye Irritation | Category 1   |

#### Label Elements



Signal Word

**Danger**

Hazard Statements

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H303 - May be harmful if swallowed  
H314 - Causes severe skin burns and eye damage

### Precautionary Statements

#### Prevention

P271 - Use only outdoors or in a well-ventilated area  
P280 - Wear protective gloves/protective clothing/eye protection/face protection  
P264 - Wash face, hands and any exposed skin thoroughly after handling  
P270 - Do not eat, drink or smoke when using this product

#### Response

P301 + P330 + P331 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting  
P303 + P361 + P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower  
P304 + P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing  
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing  
P310 - Immediately call a POISON CENTER or doctor  
P362 + P364 - Take off contaminated clothing and wash it before reuse

#### 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

### Physical and Chemical Hazards

None identified.

### Health Hazards

May be harmful if swallowed. Corrosive. Causes skin and eye burns.

### Environmental hazards

Contains no substances known to be hazardous to the environment or not degradable in waste water treatment plants. Will likely be mobile in the environment due to its water solubility. The product is water soluble, and may spread in water systems.

Toxic to terrestrial vertebrates. This product does not contain any known or suspected endocrine disruptors.

## SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

| Component                             | CAS No    | Weight % |
|---------------------------------------|-----------|----------|
| 1-Hydroxyethane-1,1-diphosphonic acid | 2809-21-4 | <=100    |

## SECTION 4. FIRST AID MEASURES

### General Advice

Show this safety data sheet to the doctor in attendance. Immediate medical attention is required.

### Eye Contact

Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Immediate medical attention is required. Keep eye wide open while rinsing.

### Skin Contact

Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Call a physician immediately.

### Inhalation

Remove to fresh air. If not breathing, give artificial respiration. Call a physician or poison control center immediately. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

### Ingestion

Immediate medical attention is required. Do NOT induce vomiting. Drink plenty of water. Never give anything by mouth to an unconscious person.

### Most important symptoms and effects

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Causes burns by all exposure routes. Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated: Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation

**Self-Protection of the First Aider**

No special precautions required.

**Notes to Physician**

Treat symptomatically.

### SECTION 5. FIRE-FIGHTING MEASURES

**Suitable Extinguishing Media**

Carbon dioxide (CO<sub>2</sub>). Powder. Water spray. In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion. CO<sub>2</sub>, dry chemical, dry sand, alcohol-resistant foam.

**Extinguishing media which must not be used for safety reasons**

No information available.

**Specific Hazards Arising from the Chemical**

The product causes burns of eyes, skin and mucous membranes.

**Protective Equipment and Precautions for Firefighters**

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Thermal decomposition can lead to release of irritating gases and vapors.

### SECTION 6. ACCIDENTAL RELEASE MEASURES

**Personal Precautions**

Use personal protective equipment as required. Evacuate personnel to safe areas. Avoid contact with skin, eyes or clothing.

**Environmental Precautions**

Should not be released into the environment. Do not allow material to contaminate ground water system. See Section 12 for additional Ecological Information.

**Methods for Containment and Clean Up**

Sweep up and shovel into suitable containers for disposal. Avoid dust formation.

Refer to protective measures listed in Sections 8 and 13.

### SECTION 7. HANDLING AND STORAGE

**Handling**

Wear personal protective equipment/face protection. Do not get in eyes, on skin, or on clothing. Use only under a chemical fume hood. Do not breathe dust. Do not ingest. If swallowed then seek immediate medical assistance.

**Storage**

Corrosives area. Keep containers tightly closed in a dry, cool and well-ventilated place.

**Specific Use(s)**

Use in laboratories

### SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Control Parameters**

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**Monitoring methods**

BS EN 14042:2003 Title Identifier: Workplace atmospheres. Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents. MDHS14/3 General methods for sampling and gravimetric analysis of respirable and inhalable dust

**Exposure Controls****Engineering Measures**

Ensure that eyewash stations and safety showers are close to the workstation location. Wherever possible, engineering control measures such as the isolation or enclosure of the process, the introduction of process or equipment changes to minimise release or contact, and the use of properly designed ventilation systems, should be adopted to control hazardous materials at source.

**Personal protective equipment**

**Eye Protection** Goggles (European standard - EN 166)

**Hand Protection** Protective gloves

| Glove material | Breakthrough time | Glove thickness | EU standard | Glove comments        |
|----------------|-------------------|-----------------|-------------|-----------------------|
| Nitrile rubber | 480 minutes       | 0.11mm          | EN 374      | (minimum requirement) |

Inspect gloves before use.

Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. (Refer to manufacturer/supplier for information)

Ensure gloves are suitable for the task: Chemical compatibility, Dexterity, Operational conditions, User susceptibility, e.g. sensitisation effects, also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion.

Remove gloves with care avoiding skin contamination.

**Skin and body protection** Long sleeved clothing

**Respiratory Protection** When workers are facing concentrations above the exposure limit they must use appropriate certified respirators. To protect the wearer, respiratory protective equipment must be the correct fit and be used and maintained properly

**Large scale/emergency use** In case of insufficient ventilation, wear suitable respiratory equipment  
**Recommended Filter type:** Multi-purpose/ABEK conforming to EN14387

**Small scale/Laboratory use** Use a NIOSH/MSHA or European Standard EN 149:2001 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced. When RPE is used a face piece Fit Test should be conducted

**Hygiene Measures** Handle in accordance with good industrial hygiene and safety practice.

**Environmental exposure controls** No information available.

### SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

**Appearance**

**Physical State** Solid

**Odor** Odorless

**Odor Threshold** No data available

**pH** No information available

**Melting Point/Range** No data available

**Softening Point** No data available

**Boiling Point/Range** No information available

**Flash Point** No information available

**Evaporation Rate** Not applicable

**Flammability (solid,gas)** No information available

**Method** - No information available  
Solid

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|  |                          |       |
|--|--------------------------|-------|
| <b>Explosion Limits</b>                        | No data available        |       |
| <b>Vapor Pressure</b>                          | No data available        |       |
| <b>Vapor Density</b>                           | Not applicable           | Solid |
| <b>Specific Gravity / Density</b>              | No data available        |       |
| <b>Bulk Density</b>                            | No data available        |       |
| <b>Water Solubility</b>                        | Soluble in water         |       |
| <b>Solubility in other solvents</b>            | No information available |       |
| <b>Partition Coefficient (n-octanol/water)</b> |                          |       |
| <b>Component</b>                               | <b>log Pow</b>           |       |
| 1-Hydroxyethane-1,1-diphosphonic acid          | -3.5                     |       |
| <b>Autoignition Temperature</b>                | No data available        |       |
| <b>Decomposition Temperature</b>               | No data available        |       |
| <b>Viscosity</b>                               | Not applicable           | Solid |
| <b>Explosive Properties</b>                    | No information available |       |
| <b>Oxidizing Properties</b>                    | No information available |       |
| <b>Molecular Formula</b>                       | CH3 C(OH)(PO3 H2)2       |       |
| <b>Molecular Weight</b>                        | 206.03                   |       |

### SECTION 10. STABILITY AND REACTIVITY

|                                 |                                 |
|---------------------------------|---------------------------------|
| <b>Stability</b>                | Stable under normal conditions. |
| <b>Hazardous Reactions</b>      | None under normal processing.   |
| <b>Hazardous Polymerization</b> | No information available.       |
| <b>Conditions to Avoid</b>      | None known.                     |
| <b>Materials to avoid</b>       | Strong bases. Oxidizing agent.  |

**Hazardous Decomposition Products** Carbon monoxide (CO). Carbon dioxide (CO<sub>2</sub>). Oxides of phosphorus.

### SECTION 11. TOXICOLOGICAL INFORMATION

#### Product Information

##### (a) acute toxicity;

| Component                             | LD50 Oral                 | LD50 Dermal                   | LC50 Inhalation |
|---------------------------------------|---------------------------|-------------------------------|-----------------|
| 1-Hydroxyethane-1,1-diphosphonic acid | LD50 = 3130 mg/kg ( Rat ) | LD50 > 10000 mg/kg ( Rabbit ) |                 |

(b) skin corrosion/irritation; Category 1 B

(c) serious eye damage/irritation; Category 1

##### (d) respiratory or skin sensitization;

|                    |                   |
|--------------------|-------------------|
| <b>Respiratory</b> | No data available |
| <b>Skin</b>        | No data available |

(e) germ cell mutagenicity; No data available

(f) carcinogenicity; No data available

There are no known carcinogenic chemicals in this product

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- (g) reproductive toxicity; No data available
- (h) STOT-single exposure; No data available
- (i) STOT-repeated exposure; No data available
- Target Organs No information available.
- (j) aspiration hazard; Not applicable  
Solid

**Symptoms / effects, both acute and delayed** Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated: Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation

### SECTION 12. ECOLOGICAL INFORMATION

#### Ecotoxicity effects

| Component                             | Freshwater Fish  | Water Flea                            | Freshwater Algae | Microtox |
|---------------------------------------|--|---------------------------------------|------------------|----------|
| 1-Hydroxyethane-1,1-diphosphonic acid | LC50: = 360 mg/L, 96h static (Oncorhynchus mykiss)<br>LC50: = 868 mg/L, 96h static (Lepomis macrochirus) | EC50: = 527 mg/L, 48h (Daphnia magna) |                  |          |

**Persistence and Degradability**  
**Persistence** Persistence is unlikely.

**Bioaccumulative Potential** Bioaccumulation is unlikely

| Component                             | log Pow | Bioconcentration factor (BCF) |
|---------------------------------------|---------|-------------------------------|
| 1-Hydroxyethane-1,1-diphosphonic acid | -3.5    | <50 dimensionless             |

**Mobility in soil** The product is water soluble, and may spread in water systems. Will likely be mobile in the environment due to its water solubility. Highly mobile in soils.

**Endocrine Disruptor Information** This product does not contain any known or suspected endocrine disruptors  
**Persistent Organic Pollutant** This product does not contain any known or suspected substance  
**Ozone Depletion Potential** This product does not contain any known or suspected substance

### SECTION 13. DISPOSAL CONSIDERATIONS

**Waste from Residues/Unused Products** Waste is classified as hazardous. Dispose of in accordance with the European Directives on waste and hazardous waste. Dispose of in accordance with local regulations.

**Contaminated Packaging** Dispose of this container to hazardous or special waste collection point.

**Other Information** Waste codes should be assigned by the user based on the application for which the product was used. Do not empty into drains. Do not flush to sewer. Large amounts will affect pH and harm aquatic organisms.

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### SECTION 14. TRANSPORT INFORMATION

#### Road and Rail Transport

**UN-No** UN3261  
**Proper Shipping Name** Corrosive solid, acidic, organic, n.o.s.  
**Technical Shipping Name** (1-Hydroxyethylidenebis(phosphonic acid))  
**Hazard Class** 8  
**Packing Group** III

#### IMDG/IMO

**UN-No** UN3261  
**Proper Shipping Name** Corrosive solid, acidic, organic, n.o.s.  
**Technical Shipping Name** (1-Hydroxyethylidenebis(phosphonic acid))  
**Hazard Class** 8  
**Packing Group** III

#### IATA

**UN-No** UN3261  
**Proper Shipping Name** Corrosive solid, acidic, organic, n.o.s.  
**Technical Shipping Name** (1-Hydroxyethylidenebis(phosphonic acid))  
**Hazard Class** 8  
**Packing Group** III

**Special Precautions for User** No special precautions required

### SECTION 15. REGULATORY INFORMATION

#### International Inventories

X = listed, China (IECSC), Europe (EINECS/ELINCS/NLP), U.S.A. (TSCA), Canada (DSL/NDSL), Philippines (PICCS), Japan (ENCS), Japan (ISHL), Australia (AICS), Korea (KECL).

| Component                             | The Inventory of Hazardous Chemicals (2015 Edition) | List of dangerous goods GB 12268 - 2012 | TCSI | IECSC | EINECS    | TSCA | DSL | PICCS | ENCS | ISHL | AICS | KECL     |
|---------------------------------------|---|---|------|-------|-----------|------|-----|-------|------|------|------|----------|
| 1-Hydroxyethane-1,1-diphosphonic acid | -   | X                                       | X    | X     | 220-552-8 | X    | X   | X     | X    | X    | X    | KE-20516 |

#### National Regulations

### SECTION 16. OTHER INFORMATION

**Prepared By** Health, Safety and Environmental Department  
**Revision Date** 22-Sep-2025  
**Revision Summary** Not applicable.

#### Training Advice

Chemical hazard awareness training, incorporating labelling, Safety Data Sheets (SDS), Personal Protective Equipment (PPE) and hygiene.

# SAFETY DATA SHEET

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### Legend

**CAS** - Chemical Abstracts Service

**EINECS/ELINCS** - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances

**PICCS** - Philippines Inventory of Chemicals and Chemical Substances

**IECSC** - Chinese Inventory of Existing Chemical Substances

**KECL** - Korean Existing and Evaluated Chemical Substances

**WEL** - Workplace Exposure Limit

**ACGIH** - American Conference of Governmental Industrial Hygienists

**DNEL** - Derived No Effect Level

**RPE** - Respiratory Protective Equipment

**LC50** - Lethal Concentration 50%

**NOEC** - No Observed Effect Concentration

**PBT** - Persistent, Bioaccumulative, Toxic

**TSCA** - United States Toxic Substances Control Act Section 8(b) Inventory

**DSL/NDL** - Canadian Domestic Substances List/Non-Domestic Substances List

**ENCS** - Japanese Existing and New Chemical Substances

**AICS** - Australian Inventory of Chemical Substances

**NZIoC** - New Zealand Inventory of Chemicals

**TWA** - Time Weighted Average

**IARC** - International Agency for Research on Cancer

**PNEC** - Predicted No Effect Concentration

**LD50** - Lethal Dose 50%

**EC50** - Effective Concentration 50%

**POW** - Partition coefficient Octanol:Water

**vPvB** - very Persistent, very Bioaccumulative

**ICAO/IATA** - International Civil Aviation Organization/International Air Transport Association

**ADR** - European Agreement Concerning the International Carriage of Dangerous Goods by Road

**OECD** - Organisation for Economic Co-operation and Development

**BCF** - Bioconcentration factor

**IMO/IMDG** - International Maritime Organization/International Maritime Dangerous Goods Code

**MARPOL** - International Convention for the Prevention of Pollution from Ships

**ATE** - Acute Toxicity Estimate

**VOC** - (Volatile Organic Compound)

### **Key literature references and sources for data**

<https://echa.europa.eu/information-on-chemicals>

Suppliers safety data sheet, Chemadvisor - LOLI, Merck index, RTECS

### **Disclaimer**

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

**End of Safety Data Sheet**