

MATERIAL SAFETY DATA SHEET**For Demonstration Purposes Only**

Date Issued: 06/05/1998
MSDS No: PSMSD-37A
Date Revised: 11/12/2007
Revision No: 2

Vinyl Phosphonic Acid -HP**1. PRODUCT AND COMPANY IDENTIFICATION**

PRODUCT NAME: Vinyl Phosphonic Acid -HP
GENERAL USE: Monomer
PRODUCT CODE: 37A
PRODUCT FORMULATION NAME: Phosphonic acid, ethenyl-
CHEMICAL FAMILY: Phosphonic acid
MOLECULAR FORMULA: C₂H₃O₃P
GENERIC NAME: VPA

MANUFACTURER

Albright & Wilson Americas Inc.
 Phosphorus Derivatives & Acrylics
 P.O. Box 4439
 Glen Allen VA 23058-4439
Emergency Contact: Product
 Stewardship Department
Transportation: (804) 968-6388
Service Number: (804) 968-6384
Alternate Customer Service: (804)
 968-6300

24 HR. EMERGENCY TELEPHONE NUMBERS

CANUTEC (Canadian Transportation) :(613) 996 - 6666
CHEMTREC (US Transportation) :(800) 424 - 9300
Emergency Phone :(843) 554 - 1229

COMMENTS: To the best of our knowledge, this Material Safety Data Sheet conforms to the requirements of US OSHA 29 CFR1910.1200, 91/155/EEC and Canadian Hazardous Products Act.

2. HAZARDS IDENTIFICATION**HAZARD DESIGNATION**

"C" - Corrosive
 R34: Causes burns.

EMERGENCY OVERVIEW

PHYSICAL APPEARANCE: Clear pale yellow organic liquid with mild odor.

IMMEDIATE CONCERNS: DANGER! Causes eye and skin burns.

POTENTIAL HEALTH EFFECTS

EYES: Will cause corrosive effects (burns or irreversible damage) to the eyes.

SKIN: Will cause corrosive effects (burns or irreversible damage) to the skin.

INGESTION: Will cause corrosive effects (burns or irreversible damage) to the mouth, throat and digestive tract.

INHALATION: Will cause corrosive effects (burns or irreversible damage) to the lungs, upper respiratory tract and nose.

SIGNS AND SYMPTOMS OF OVEREXPOSURE

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Vinyl Phosphonic Acid -HP**EYES:** Severe burning of the eyes.**SKIN:** Severe burning of the skin.**INGESTION:** Possible nausea and/or vomiting.**INHALATION:** Coughing, burning, tightness of chest and/or shortness of breath.**ACUTE TOXICITY:** No test data is available for acute dermal toxicity.

Not expected to cause significant adverse effects if ingested.

No test data is available for acute inhalation toxicity.

CARCINOGENICITY: Not Listed by NTP

Not listed by IARC

Not listed by OSHA

MUTAGENICITY: Not Available**REPRODUCTIVE TOXICITY****REPRODUCTIVE EFFECTS:** Not Available**TERATOGENIC EFFECTS:** Not Available**MEDICAL CONDITIONS AGGRAVATED:** None known**TARGET ORGAN STATEMENT:** Contains material which can cause gastrointestinal and respiratory tract effects based on animal data.**SENSITIZATION:** Not Available**COMMENTS:** For detailed toxicological information see Section 11.**3. COMPOSITION / INFORMATION ON INGREDIENTS**

| Chemical Name | Wt.% | CAS | EINECS |
|---------------------------|------|-------------|-----------|
| Phosphonic Acid, Ethenyl- | ~ 90 | 001746-03-8 | 217-123-2 |

4. FIRST AID MEASURES**EYES:** Immediately flush eyes with plenty of water for two to three minutes. Remove any contact lenses and continue flushing for 15 minutes. Get immediate medical attention.**SKIN:** Remove contaminated clothing including shoes and immediately wash affected area with plenty of soap and water. Seek immediate medical attention. Wash contaminated clothing and shoes before reuse.**INGESTION:** Wash out mouth with water, keep at rest. Seek immediate medical attention. Do NOT induce vomiting unless directed to do so by medical personnel.**INHALATION:** Remove from further exposure. Keep warm and at rest. If not breathing, give artificial respiration. If breathing is difficult, trained personnel should administer oxygen. Seek immediate medical attention.

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 Revision No: 2

Vinyl Phosphonic Acid -HP

5. FIRE FIGHTING MEASURES

FLASHPOINT AND METHOD: Not Available

FLAMMABLE LIMITS: Not Available

AUTOIGNITION TEMPERATURE: 485°C (905°F)

FLAMMABLE CLASS: Nonflammable

FLAME PROPAGATION OR BURNING RATE OF SOLIDS: Not Applicable

GENERAL HAZARD: Evacuate personnel downwind of fire to avoid inhalation of irritating and/or harmful fumes and smoke.

EXTINGUISHING MEDIA: Alcohol type foam, CO₂ (Carbon Dioxide), Dry Chemical, Water Fog

HAZARDOUS COMBUSTION PRODUCTS: Oxides of both carbon and phosphorus

FIRE FIGHTING PROCEDURES: This product is a nonflammable substance. However, hazardous decomposition and combustion products may be formed in a fire situation. Cool exposed containers with water spray to prevent overheating.

FIRE FIGHTING EQUIPMENT: Respiratory and eye protection are required for fire fighting personnel. Full protective equipment (Bunker Gear) and self contained breathing apparatus (SCBA) should be used for all indoor fires and any significant outdoor fires. For small outdoor fires, which may easily be extinguished with a portable fire extinguisher, use of a SCBA may not be required.

SENSITIVE TO STATIC DISCHARGE: Not Available

SENSITIVITY TO IMPACT: Not Available

6. ACCIDENTAL RELEASE MEASURES

SMALL SPILL: Wearing the appropriate personal protective equipment designated in Section 8, move the leaking container to a containment area or rotate the container so that the opening is above the liquid level.

LARGE SPILL: Construct temporary dikes of dirt, sand, or any appropriate readily available material to prevent spreading of the material.

Wearing the appropriate personal protective equipment designated in Section 8, close or cap valves and/or block or plug hole in leaking container and transfer to another container.

Contain material as described above and call the local fire or police department for immediate emergency assistance.

ENVIRONMENTAL PRECAUTIONS

WATER SPILL: Use appropriate containment to avoid runoff or release to sewer or waterways.

LAND SPILL: Use appropriate containment to avoid runoff or release to ground.

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Date Issued: 06/05/1998
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Vinyl Phosphonic Acid -HP

GENERAL PROCEDURES: Remove containers of strong oxidizers and strong bases from release area.

RELEASE NOTES: If spill could potentially enter any waterway, including intermittent dry creeks, contact the local authorities. If in the U.S., contact the US COAST GUARD NATIONAL RESPONSE CENTER toll free number 800-424-8802.

In case of accident or road spill notify: CHEMTREC in USA at 800-424-9300 CANUTEC in Canada at 613-996-6666 CHEMTREC, other countries, at (International code)+1 703 527 3887

COMMENTS: See Section 13 for disposal information and Section 15 for regulatory requirements. Large and small spills may have a broad definition depending on the user's handling system. Therefore, the spill category must be defined at the point of release by technically qualified personnel.

7. HANDLING AND STORAGE

HANDLING: Use appropriate personal protective equipment as specified in Section 8. Handle in a well ventilated area.

Handle and use in a manner consistent with good industrial/manufacturing techniques and practices.

STORAGE: Store in unopened containers under cool and dry conditions.

Do not store with, or close to oxidizers and bases.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION**EXPOSURE GUIDELINES**

| OSHA HAZARDOUS COMPONENTS (29 CFR1910.1200) | | | |
|----------------------------------------------------|-------------|-------------------------|------------------------|
| | | | EXPOSURE LIMITS |
| | | | Supplier OEL |
| Chemical Name | | | |
| | ppm | mg/m³ | |
| Phosphonic Acid, Ethenyl- | TWA | NL | NL |
| | STEL | NL | NL |

ENGINEERING CONTROLS: If dust, vapors, or mists are generated, provide local exhaust ventilation to control airborne levels below the exposure limit.

PERSONAL PROTECTIVE EQUIPMENT

EYES AND FACE: Wear chemical splash goggles and face shield when eye and face contact is possible due to splashing or spraying of material.

SKIN: Where contact is likely, wear neoprene chemical resistant gloves, a chemical suit, rubber boots, chemical safety goggles and a face shield.

RESPIRATORY: Always wear NIOSH approved respiratory protective equipment when vapor or mists

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For Demonstration Purposes Only



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Vinyl Phosphonic Acid -HP

may exceed applicable concentration limits.

WORK HYGIENIC PRACTICES: Facilities storing or using this material should be equipped with an eyewash facility and a safety shower.

Good personal hygiene practices should always be followed.

COMMENTS: No PEL's, TLV's or OEL's for this product or it's ingredients are listed in the current issue of ACGIH's Guide to Occupational Exposure Values nor have they been determined by the manufacturer.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: Liquid

ODOR: Characteristic

COLOR: Pale yellow

pH: Not Available

VAPOR PRESSURE: Not Available

VAPOR DENSITY: Not Available

BOILING POINT: > 200°C (392°F)

FREEZING POINT: Not Available

MELTING POINT: Not Applicable

FLASHPOINT AND METHOD: Not Available

SOLUBILITY IN WATER: Soluble

EVAPORATION RATE: Not Available

DENSITY: 1.45 g/ml

SPECIFIC GRAVITY: 1.450 @ 20°C/4°C

VISCOSITY #1: 25 Centipoise at 25°C

MOLECULAR WEIGHT: 108

COEFF. OIL/WATER: Not Available

10. STABILITY AND REACTIVITY

STABLE: Yes

HAZARDOUS POLYMERIZATION: Yes

STABILITY: The product is stable under normal ambient conditions of temperature and pressure.

MATERIAL SAFETY DATA SHEET

For Demonstration Purposes Only



Date Issued: 06/05/1998
MSDS No: PSMSD-37A
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Revision No: 2

Vinyl Phosphonic Acid -HP

POLYMERIZATION: Will not occur

CONDITIONS TO AVOID: Heat, temperatures above 200°C.

HAZARDOUS DECOMPOSITION PRODUCTS: Oxides of both phosphorus and carbon and acids of phosphorus.

INCOMPATIBLE MATERIALS: Strong Oxidizers

11. TOXICOLOGICAL INFORMATION

ACUTE

EYES: 0

DERMAL LD₅₀: Not Available

ORAL LD₅₀: > 2000 mg/kg (rat)

INHALATION LC₅₀: Not Available

EYE EFFECTS: This material is corrosive to the eyes.

SKIN EFFECTS: This material is corrosive to the skin.

CARCINOGENICITY

IARC: Listed by IARC - No

NTP: Listed by NTP - No

OSHA: Listed by OSHA - No

SENSITIZATION: Not Available

REPRODUCTIVE EFFECTS: Not Available

TARGET ORGANS: Eyes

Skin

Gastrointestinal tract

Respiratory system

TERATOGENIC EFFECTS: Not Available

MUTAGENICITY: Not Available

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL DATA: May cause adverse environmental impact if material reaches waterways.

ECOTOXICOLOGICAL INFORMATION: Not Available

DISTRIBUTION: Not Available

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For Demonstration Purposes Only



Date Issued: 06/05/1998
MSDS No: PSMSD-37A
Date Revised: 11/12/2007
Revision No: 2

Vinyl Phosphonic Acid -HP

CHEMICAL FATE INFORMATION: Not Available

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: Dispose of waste at an appropriate waste disposal facility according to current applicable laws and regulations.

FOR LARGE SPILLS: Contain material and call local authorities for emergency assistance. In consultation with the appropriate authorities, determine the disposal method or contact Albright & Wilson Americas.

PRODUCT DISPOSAL: Dispose of at a supervised incineration facility or an appropriate waste disposal facility according to current applicable laws and regulations and product characteristics at time of disposal.

EMPTY CONTAINER: Rinse drums with a suitable solvent and steam to remove vapors before disposal or reuse in accordance with applicable regulations.

GENERAL COMMENTS: Refer to Section 6, Accidental Release Measures for additional information.

14. TRANSPORT INFORMATION

DOT (DEPARTMENT OF TRANSPORTATION)

PROPER SHIPPING NAME: Corrosive Liquid, Acidic, Organic N.O.S.

TECHNICAL NAME: Phosphonic acid, ethenyl-

PRIMARY HAZARD CLASS/DIVISION: 8

UN/NA NUMBER: UN3265

PACKING GROUP: III

NAERG: 153

LABEL: Corrosive

U.S. CUSTOMS HARMONIZATION NUMBER: 2931.00.90.30

ROAD AND RAIL (ADR/RID)

KEMLER NUMBER: 40°C

HAZARD CLASS: 8

AIR (ICAO/IATA)

SHIPPING NAME: Corrosive Liquid, Acidic, Organic N.O.S.

TECHNICAL NAME: Phosphonic acid, ethenyl-

UN/NA NUMBER: UN3265

PRIMARY HAZARD CLASS/DIVISION: 3

PACKING GROUP: III

LABEL: Corrosive

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 MSDS No: PSMSD-37A
 Date Revised: 11/12/2007
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Corrosive

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT)**FIRE:** No **PRESSURE GENERATING:** No **REACTIVITY:** No **ACUTE:** Yes **CHRONIC:** No**313 REPORTABLE INGREDIENTS:** Not Applicable**TITLE III NOTES:** Not Applicable**CERCLA (COMPREHENSIVE RESPONSE, COMPENSATION, AND LIABILITY ACT)****CERCLA RQ:** Not Applicable**TSCA (TOXIC SUBSTANCE CONTROL ACT)**

| Chemical Name | CAS |
|---------------------------|-------------|
| Phosphonic Acid, Ethenyl- | 001746-03-8 |

TSCA REGULATORY: All intentional ingredients are listed on the TSCA Inventory.**REGULATIONS**

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Date Issued: 06/05/1998
MSDS No: PSMSD-37A
Date Revised: 11/12/2007
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Vinyl Phosphonic Acid -HP

STATE REGULATIONS Not Available

LOCAL REGULATIONS: Not Available

NATIONAL RESPONSE CENTER: U.S. Coast Guard National Center telephone # 1-800-424-8802

CANADA

WHMIS HAZARD SYMBOL AND CLASSIFICATION



Corrosive
Corrosive, Class E

WHMIS (WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM): This product is WHMIS controlled.

CANADA INGREDIENT DISCLOSURE LIST: This product does contain ingredient(s) on the "Ingredient Disclosure List".

CANADIAN ENVIRONMENTAL PROTECTION ACT: All intentional ingredients are not listed on the DSL (Domestic Substances List).
This product in Canada is for Research and Development use only.

EUROPEAN COMMUNITY

EEC LABEL SYMBOL AND CLASSIFICATION



"C" - Corrosive
R34: Causes burns.
S36/39: Wear suitable protective clothing and eye/face protection.
S24/25: Avoid contact with skin or eyes.
S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S28: After contact with skin, wash immediately with plenty of soap and water.

EUROPEAN COMMUNITY REGULATORY: All intentional ingredients are listed on the European's EINECS Inventory.

MEXICO This product is considered to be corrosive according to Mexican Standard, Instruction No. 9, ANNEX I.

16. OTHER INFORMATION

REASON FOR ISSUE: New MSDS

APPROVED BY: Paul R. Larson **TITLE:** Product Stewardship Manager

PREPARED BY: Product Stewardship Department

INFORMATION CONTACT: Product Stewardship Analyst

REVISION SUMMARY: Revision #: 2 This MSDS replaces the August 31, 1999 MSDS. Any changes in information are as follows: In Section 1 MSDS Classification

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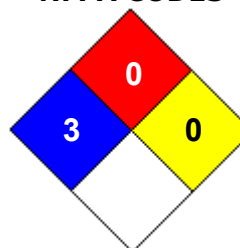
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MSDS No: PSMSD-37A
Date Revised: 11/12/2007
Revision No: 2

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HMIS RATING

| | |
|-----------------------------|----------|
| HEALTH: | 3 |
| FLAMMABILITY: | 0 |
| PHYSICAL HAZARD: | 0 |
| PERSONAL PROTECTION: | D |

NFPA CODES



MANUFACTURER SUPPLEMENTAL NOTES: HAZARD WARNING: This product belongs to a chemical family that HAS BEEN TESTED in combination with Trimethylolpropane , Trimethylolpropane derived products or their corresponding Trimethylolpropane homologs for toxicity of the thermal decomposition products in the absence of flame. Products in this chemical family PRODUCED NO SIGNIFICANT ADVERSE HEALTH EFFECTS in laboratory animals. However, there is a possibility that this thermal decomposition may produce bicyclic phosphates and/or phosphites in combination with certain other phosphorus compounds. Bicyclic phosphates and phosphites have acute neurotoxic properties and may cause convulsive seizures in laboratory test animals. Follow all precautionary measures outlined in this Material Safety Data Sheet and/or contact Albright & Wilson Americas.

DATA SOURCES: Toxicological and ecological data based on Albright & Wilson UK Limited internal study reports.

MANUFACTURER DISCLAIMER: Information given herein is offered in good faith as accurate, but without guarantee. Conditions of use and suitability of the product for particular uses are beyond our control; all risks of use of the product are therefore assumed by the user. Nothing is intended as a recommendation for uses which infringe valid patents or as extending license under valid patents. Appropriate warnings and safe handling procedures should be provided to handlers and users.