

# D(-)-2-Amino-5-phosphonovaleric acid (D-AP5)

sc-200434

Material Safety Data Sheet



The Power to Question

Hazard Alert Code Key:

EXTREME

HIGH

MODERATE

LOW

## Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

### PRODUCT NAME

D(-)-2-Amino-5-phosphonovaleric acid (D-AP5)

### STATEMENT OF HAZARDOUS NATURE

CONSIDERED A HAZARDOUS SUBSTANCE ACCORDING TO OSHA 29 CFR 1910.1200.

### NFPA



### SUPPLIER

Santa Cruz Biotechnology, Inc.  
2145 Delaware Avenue  
Santa Cruz, California 95060  
800.457.3801 or 831.457.3800

### EMERGENCY

ChemWatch

Within the US & Canada: 877-715-9305

Outside the US & Canada: +800 2436 2255

(1-800-CHEMCALL) or call +613 9573 3112

### SYNONYMS

C5-H12-N-O5-P, "D-norvaline, 5-phosphono-", 5-phosphono-D-norvaline, "D-aminophosphonovaleric acid", "D-2-amino-5-phosphonopentanoic acid", D-AP-5, "NMDA antagonist"

## Section 2 - HAZARDS IDENTIFICATION

### CHEMWATCH HAZARD RATINGS

|               |   | Min | Max |
|---------------|---|-----|-----|
| Flammability: | 1 |     |     |
| Toxicity:     | 2 |     |     |
| Body Contact: | 2 |     |     |
| Reactivity:   | 1 |     |     |
| Chronic:      | 2 |     |     |

Min/Nil=0  
Low=1  
Moderate=2  
High=3  
Extreme=4

### CANADIAN WHMIS SYMBOLS



## EMERGENCY OVERVIEW

### RISK

Irritating to eyes, respiratory system and skin.

### POTENTIAL HEALTH EFFECTS

#### ACUTE HEALTH EFFECTS

##### SWALLOWED

■ Accidental ingestion of the material may be damaging to the health of the individual.

■ The material may bind to the N-methyl-D-aspartate (NMDA) neuroreceptor.

The NMDA receptor is an ionotropic glutamate receptor found on post-synaptic neurons and is a membrane channel that regulates the flow of sodium and calcium ions, flowing into the neuron, while potassium ions flow out.

##### EYE

■ This material can cause eye irritation and damage in some persons.

##### SKIN

■ This material can cause inflammation of the skin on contact in some persons.

■ The material may accentuate any pre-existing dermatitis condition.

■ Skin contact is not thought to have harmful health effects, however the material may still produce health damage following entry through wounds, lesions or abrasions.

■ Open cuts, abraded or irritated skin should not be exposed to this material.

■ Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects.

Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

##### INHALED

■ The material can cause respiratory irritation in some persons.

The body's response to such irritation can cause further lung damage.

■ Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled.

#### CHRONIC HEALTH EFFECTS

■ Long-term exposure to respiratory irritants may result in disease of the airways involving difficult breathing and related systemic problems. Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems.

Long term exposure to high dust concentrations may cause changes in lung function i.e. pneumoconiosis; caused by particles less than 0.5 micron penetrating and remaining in the lung.

## Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

| NAME                                  | CAS RN     | %   |
|---------------------------------------|------------|-----|
| D-(-)-2-amino-5-phosphonovaleric acid | 79055-68-8 | >98 |

## Section 4 - FIRST AID MEASURES

##### SWALLOWED

· If swallowed do NOT induce vomiting. · If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.

##### EYE

■ If this product comes in contact with the eyes: · Wash out immediately with fresh running water. · Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.

##### SKIN

■ If skin contact occurs: · Immediately remove all contaminated clothing, including footwear · Flush skin and hair with running water (and soap if available).

##### INHALED

· If fumes or combustion products are inhaled remove from contaminated area. · Lay patient down. Keep warm and rested.

#### NOTES TO PHYSICIAN

■ Treat symptomatically.

## Section 5 - FIRE FIGHTING MEASURES

|                             |                |
|-----------------------------|----------------|
| Vapour Pressure (mmHG):     | Negligible     |
| Upper Explosive Limit (%):  | Not available. |
| Specific Gravity (water=1): | Not available  |
| Lower Explosive Limit (%):  | Not available  |

#### EXTINGUISHING MEDIA

· Water spray or fog.

- Foam.

## **FIRE FIGHTING**

- Alert Emergency Responders and tell them location and nature of hazard.
- Wear breathing apparatus plus protective gloves.

## **GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS**

- Combustible solid which burns but propagates flame with difficulty.
- Avoid generating dust, particularly clouds of dust in a confined or unventilated space as dusts may form an explosive mixture with air, and any source of ignition, i.e. flame or spark, will cause fire or explosion. Dust clouds generated by the fine grinding of the solid are a particular hazard; accumulations of fine dust may burn rapidly and fiercely if ignited.
- Combustion products include: carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), phosphorus oxides (PO<sub>x</sub>), other pyrolysis products typical of burning organic material.
- May emit poisonous fumes.
- May emit corrosive fumes.

## **FIRE INCOMPATIBILITY**

- Avoid contamination with oxidizing agents i.e. nitrates, oxidizing acids, chlorine bleaches, pool chlorine etc. as ignition may result.

## **PERSONAL PROTECTION**

Glasses:  
Chemical goggles.  
Gloves:  
Respirator:  
Particulate

## **Section 6 - ACCIDENTAL RELEASE MEASURES**

### **MINOR SPILLS**

- Remove all ignition sources.
- Clean up all spills immediately.
- Avoid contact with skin and eyes.
- Control personal contact by using protective equipment.
- Use dry clean up procedures and avoid generating dust.
- Place in a suitable, labelled container for waste disposal.

### **MAJOR SPILLS**

- Moderate hazard.
- CAUTION: Advise personnel in area.
- Alert Emergency Responders and tell them location and nature of hazard.

## **Section 7 - HANDLING AND STORAGE**

### **PROCEDURE FOR HANDLING**

- Avoid all personal contact, including inhalation.
  - Wear protective clothing when risk of exposure occurs.
- Empty containers may contain residual dust which has the potential to accumulate following settling. Such dusts may explode in the presence of an appropriate ignition source.
- Do NOT cut, drill, grind or weld such containers.
  - In addition ensure such activity is not performed near full, partially empty or empty containers without appropriate workplace safety authorisation or permit.

### **RECOMMENDED STORAGE METHODS**

- Polyethylene or polypropylene container.
- Check all containers are clearly labelled and free from leaks.

### **STORAGE REQUIREMENTS**

- Observe manufacturer's storing and handling recommendations.

## **Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION**

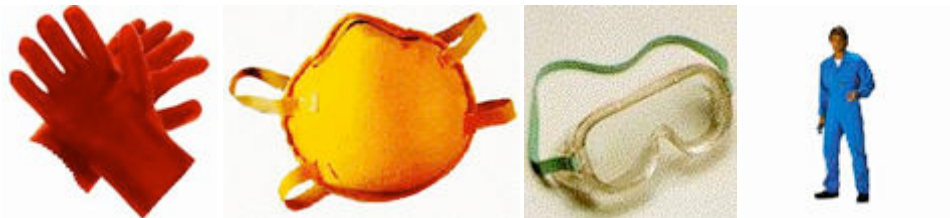
### **EXPOSURE CONTROLS**

| Source                                                 | Material                                                                                                       | TWA ppm | TWA mg/m <sup>3</sup> | STEL ppm | STEL mg/m <sup>3</sup> | Peak ppm | Peak mg/m <sup>3</sup> | TWA F/CC | Notes |
|--------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|---------|-----------------------|----------|------------------------|----------|------------------------|----------|-------|
| Canada - British Columbia Occupational Exposure Limits | D-(-)-2-amino-5-phosphonovaleric acid (Particles Insoluble or Poorly Soluble) Not Otherwise Classified (PNOC)) |         | 10 (N)                |          |                        |          |                        |          |       |

|                                                                                                    |                                                                                                                             |    |                                                                                                                                                                                                                              |
|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| US - Wyoming<br>Toxic and<br>Hazardous<br>Substances<br>Table Z1 Limits<br>for Air<br>Contaminants | D-(-)-2-amino-<br>5-phosphonovaleric<br>acid (Particulates not<br>otherwise regulated<br>(PNOR)(f)- Respirable<br>fraction) | 5  |                                                                                                                                                                                                                              |
| US - Tennessee<br>Occupational<br>Exposure Limits<br>- Limits For Air<br>Contaminants              | D-(-)-2-amino-<br>5-phosphonovaleric<br>acid (Particulates not<br>otherwise regulated<br>Respirable fraction)               | 5  |                                                                                                                                                                                                                              |
| US - California<br>Permissible<br>Exposure Limits<br>for Chemical<br>Contaminants                  | D-(-)-2-amino-<br>5-phosphonovaleric<br>acid (Particulates not<br>otherwise regulated<br>Respirable fraction)               | 5  | (n)                                                                                                                                                                                                                          |
| US - Oregon<br>Permissible<br>Exposure Limits<br>(Z-1)                                             | D-(-)-2-amino-<br>5-phosphonovaleric<br>acid (Particulates not<br>otherwise regulated<br>(PNOR) (f) Total Dust)             | 10 | Bold print<br>identifies<br>substances<br>for which the<br>Oregon<br>Permissible<br>Exposure<br>Limits (PELs)<br>are different<br>than the<br>federal<br>Limits. PNOR<br>means<br>“particles not<br>otherwise<br>regulated.” |
| US - Michigan<br>Exposure Limits<br>for Air<br>Contaminants                                        | D-(-)-2-amino-<br>5-phosphonovaleric<br>acid (Particulates not<br>otherwise regulated,<br>Respirable dust)                  | 5  |                                                                                                                                                                                                                              |
| Canada - Prince<br>Edward Island<br>Occupational<br>Exposure Limits                                | D-(-)-2-amino-<br>5-phosphonovaleric<br>acid (Particles<br>(Insoluble or Poorly<br>Soluble) [NOS]<br>Inhalable particles)   | 10 | See<br>Appendix B<br>current<br>TLV/BEI<br>Book                                                                                                                                                                              |
| US - Oregon<br>Permissible<br>Exposure Limits<br>(Z-1)                                             | D-(-)-2-amino-<br>5-phosphonovaleric<br>acid (Particulates not<br>otherwise regulated<br>(PNOR) (f) Respirable<br>Fraction) | 5  | Bold print<br>identifies<br>substances<br>for which the<br>Oregon<br>Permissible<br>Exposure<br>Limits (PELs)<br>are different<br>than the<br>federal<br>Limits. PNOR<br>means<br>“particles not<br>otherwise<br>regulated.” |

ENDOELTABLE

## PERSONAL PROTECTION



## RESPIRATOR

Particulate

Consult your EHS staff for recommendations

## EYE

- Safety glasses with side shields.
- Chemical goggles.

## HANDS/FEET

■ Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include: such as:

- frequency and duration of contact,
- chemical resistance of glove material,
- glove thickness and
- dexterity

Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739).

· When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374) is recommended.

· When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374) is recommended.

· Contaminated gloves should be replaced.

Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.

Experience indicates that the following polymers are suitable as glove materials for protection against undissolved, dry solids, where abrasive particles are not present.

- polychloroprene
- nitrile rubber
- butyl rubber
- fluorocautchouc
- polyvinyl chloride

Gloves should be examined for wear and/ or degradation constantly.

## OTHER

- Overalls.
- P.V.C. apron.
- Barrier cream.
- Skin cleansing cream.
- Eye wash unit.

## ENGINEERING CONTROLS

- Local exhaust ventilation is required where solids are handled as powders or crystals; even when particulates are relatively large, a certain proportion will be powdered by mutual friction.
- Exhaust ventilation should be designed to prevent accumulation and recirculation of particulates in the workplace.

## Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

### PHYSICAL PROPERTIES

Solid.

Mixes with water.

|                           |                |                                |                |
|---------------------------|----------------|--------------------------------|----------------|
| State                     | Divided solid  | Molecular Weight               | 197.13         |
| Melting Range (°F)        | Not available  | Viscosity                      | Not Applicable |
| Boiling Range (°F)        | Not available  | Solubility in water (g/L)      | Miscible       |
| Flash Point (°F)          | Not available  | pH (1% solution)               | Not applicable |
| Decomposition Temp (°F)   | Not available  | pH (as supplied)               | Not applicable |
| Autoignition Temp (°F)    | Not available  | Vapour Pressure (mmHG)         | Negligible     |
| Upper Explosive Limit (%) | Not available. | Specific Gravity (water=1)     | Not available  |
| Lower Explosive Limit (%) | Not available  | Relative Vapor Density (air=1) | >1             |
| Volatile Component (%vol) | Negligible     | Evaporation Rate               | Not available  |

### APPEARANCE

Solid; mixes with water.

## Section 10 - CHEMICAL STABILITY

### CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.

### STORAGE INCOMPATIBILITY

- Avoid reaction with oxidizing agents.

For incompatible materials - refer to Section 7 - Handling and Storage.

## Section 11 - TOXICOLOGICAL INFORMATION

D-(-)-2-amino-5-phosphonovaleric acid

### TOXICITY AND IRRITATION

#### D-(-)-2-AMINO-5-PHOSPHONOVALERIC ACID:

- unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

■ Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergenic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound. Key criteria for the diagnosis of RADS include the absence of preceding respiratory disease, in a non-atopic individual, with abrupt onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. A reversible airflow pattern, on spirometry, with the presence of moderate to severe bronchial hyperreactivity on methacholine challenge testing and the lack of minimal lymphocytic inflammation, without eosinophilia, have also been included in the criteria for diagnosis of RADS. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. Industrial bronchitis, on the other hand, is a disorder that occurs as result of exposure due to high concentrations of irritating substance (often particulate in nature) and is completely reversible after exposure ceases. The disorder is characterised by dyspnea, cough and mucus production.

No significant acute toxicological data identified in literature search.

## Section 12 - ECOLOGICAL INFORMATION

No data

## Section 13 - DISPOSAL CONSIDERATIONS

### Disposal Instructions

All waste must be handled in accordance with local, state and federal regulations.

‡ Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.

A Hierarchy of Controls seems to be common - the user should investigate:

- Reduction
- Reuse
- Recycling
- Disposal (if all else fails)

This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate.

DO NOT allow wash water from cleaning equipment to enter drains. Collect all wash water for treatment before disposal.

- Recycle wherever possible.

· Consult manufacturer for recycling options or consult Waste Management Authority for disposal if no suitable treatment or disposal facility can be identified.

## Section 14 - TRANSPORTATION INFORMATION

NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS: DOT, IATA, IMDG

## Section 15 - REGULATORY INFORMATION

**D-(-)-2-amino-5-phosphonovaleric acid (CAS: 79055-68-8) is found on the following regulatory lists;**

"US - California Air Toxics ""Hot Spots"" List (Assembly Bill 2588) Substances for which emissions must be quantified"

## Section 16 - OTHER INFORMATION

*Reasonable care has been taken in the preparation of this information, but the author makes no warranty of merchantability or any other warranty, expressed or implied, with respect to this information. The author makes no*

*representations and assumes no liability for any direct, incidental or consequential damages resulting from its use. For additional technical information please call our toxicology department on +800 CHEMCALL.*

■ Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

A list of reference resources used to assist the committee may be found at:

[www.chemwatch.net/references](http://www.chemwatch.net/references).

■ The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

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