

# 4,4'-Diaminostilbene-2,2'-disulfonic Acid

sc-210166



The Power is Question

Material Safety Data Sheet

Hazard Alert Code Key: **EXTREME** **HIGH** **MODERATE** **LOW**

## Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

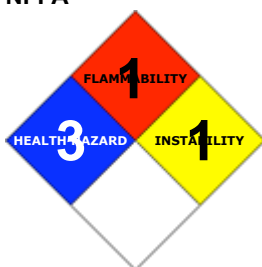
### PRODUCT NAME

4,4'-Diaminostilbene-2,2'-disulfonic Acid

### 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

C14-H14-N2-O6-S2, H2NC6H3(SO3H)CHCHC6H3(SO3H)NH2, "benzenesulfonic acid, 2, 2' -(1, 2-ethenediyl)bis(5-amino-", "2, 2' -(1, 2-ethenediyl)bis(5-aminobenzenesulfonic acid)", "4, 4' -diamino-2, 2' -stilbenedisulfonic acid", "amsonic acid", DAS, "diaminostilbenedisulfonic acid", "flavonic acid"

## Section 2 - HAZARDS IDENTIFICATION

### CHEMWATCH HAZARD RATINGS

	Min	Max
Flammability:	1	
Toxicity:	2	
Body Contact:	3	
Reactivity:	1	
Chronic:	2	

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



### CANADIAN WHMIS SYMBOLS



## EMERGENCY OVERVIEW

### RISK

Causes burns.  
Risk of serious damage to eyes.  
May cause SENSITISATION by skin contact.  
Harmful by inhalation, in contact with skin and if swallowed.

### POTENTIAL HEALTH EFFECTS

#### ACUTE HEALTH EFFECTS

##### SWALLOWED

- Accidental ingestion of the material may be harmful; animal experiments indicate that ingestion of less than 150 gram may be fatal or may produce serious damage to the health of the individual.
- The material can produce chemical burns within the oral cavity and gastrointestinal tract following ingestion.
- Oral doses of 4,4'-diaminostilbene-2,2'-disulfonic acid produced uterotrophic effects in weanling female rats. Responses to oral doses were not significantly different to responses to the same dose given intraperitoneally (see chronic effects).
- Ingestion of acidic corrosives may produce burns around and in the mouth. the throat and esophagus.

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##### EYE

- The material can produce chemical burns to the eye following direct contact. Vapors or mists may be extremely irritating.
- If applied to the eyes, this material causes severe eye damage.
- Direct eye contact with acid corrosives may produce pain, tears, sensitivity to light and burns. Mild burns of the epithelia generally recover rapidly and completely.

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##### SKIN

- Skin contact with the material may be harmful; systemic effects may result following absorption.
- The material can produce chemical burns following direct contact with the skin.
- Skin contact with acidic corrosives may result in pain and burns; these may be deep with distinct edges and may heal slowly with the formation of scar tissue.
- 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

- Inhalation of dusts, generated by the material, during the course of normal handling, may be harmful.
- The material can cause respiratory irritation in some persons. The body's response to such irritation can cause further lung damage.
- Corrosive acids can cause irritation of the respiratory tract, with coughing, choking and mucous membrane damage. There may be dizziness, headache, nausea and weakness.

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- 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. Skin contact with the material is more likely to cause a sensitization reaction in some persons compared to the general population. Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems.

Intraperitoneal injection of 4,4'-diaminostilbene-2,2'-disulfonic acid in female rats produced oestrogenic activity resulting in increased uterine weights.

At least one study indicates that sexual dysfunction may occur in male workers involved in the production of this material; signs include problems with maintaining erections, with experiencing pleasure from sex, and with ejaculation. Decreased libido was also apparent.

Another study reported that lower testosterone levels were seen amongst workers exposed to the chemical.

Repeated or prolonged exposure to acids may result in the erosion of teeth, swelling and or ulceration of mouth lining. Irritation of airways to lung, with cough, and inflammation of lung tissue often occurs.

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## Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
4,4'-diaminostilbene-2,2'-disulfonic acid	81-11-8	>98

## Section 4 - FIRST AID MEASURES

## SWALLOWED

· For advice, contact a Poisons Information Center or a doctor at once. · Urgent hospital treatment is likely to be needed.

## EYE

■ If this product comes in contact with the eyes: · Immediately hold eyelids apart and flush the eye continuously with 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 or hair contact occurs: · Immediately flush body and clothes with large amounts of water, using safety shower if available. · Quickly remove all contaminated clothing, including footwear.

## INHALED

· If fumes or combustion products are inhaled remove from contaminated area. · Lay patient down. Keep warm and rested. Inhalation of vapors or aerosols (mists, fumes) may cause lung edema. Corrosive substances may cause lung damage (e.g. <p>.

## NOTES TO PHYSICIAN

■ Treat symptomatically.

For acute or short term repeated exposures to strong acids:

· Airway problems may arise from laryngeal edema and inhalation exposure. Treat with 100% oxygen initially.

· Respiratory distress may require cricothyroidotomy if endotracheal intubation is contraindicated by excessive swelling.

## Section 5 - FIRE FIGHTING MEASURES

Vapour Pressure (mmHG): <math>< 1.3 \times 10^{-5}</math> (25 C)

Upper Explosive Limit (%): Not available.

Specific Gravity (water=1): 2.45

Lower Explosive Limit (%): Not available

## EXTINGUISHING MEDIA

· Foam.

· Dry chemical powder.

## FIRE FIGHTING

· Alert Emergency Responders and tell them location and nature of hazard.

· Wear full body protective clothing with breathing apparatus.

When any large container (including road and rail tankers) is involved in a fire, consider evacuation by 800 metres in all directions.

## GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS

· Combustible.

· Slight fire hazard when exposed to heat or flame.

Combustion products include: carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), sulfur oxides (SO<sub>x</sub>), other pyrolysis products typical of burning organic material.

## FIRE INCOMPATIBILITY

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

## PERSONAL PROTECTION

Glasses:

Full face- shield.

Gloves:

Respirator:

Particulate dust filter.

Acid vapour Type B cartridge/ canister.

## 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.

· Drains for storage or use areas should have retention basins for pH adjustments and dilution of spills before discharge or disposal of material.

· Check regularly for spills and leaks.

### MAJOR SPILLS

· Clear area of personnel and move upwind.

· 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**

- DO NOT use aluminum or galvanized containers.
- Check regularly for spills and leaks.
- Lined metal can, Lined metal pail/drum
- Plastic pail.
- For low viscosity materials
- Drums and jerricans must be of the non-removable head type.
- Where a can is to be used as an inner package, the can must have a screwed enclosure.

**STORAGE REQUIREMENTS**

- Store in original containers.
- Keep containers securely sealed.

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

**EXPOSURE CONTROLS**

Source	Material	TWA ppm	TWA mg/m³	STEL ppm	STEL mg/m³	Peak ppm	Peak mg/m³	TWA F/CC	Notes
US - California Permissible Exposure Limits for Chemical Contaminants	4,4'-diaminostilbene-2,2'-disulfonic acid (Particulates not otherwise regulated Respirable fraction)		5						(n)
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants	4,4'-diaminostilbene-2,2'-disulfonic acid (Particulates not otherwise regulated Respirable fraction)		5						
US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants	4,4'-diaminostilbene-2,2'-disulfonic acid (Particulates not otherwise regulated (PNOR)(f)- Respirable fraction)		5						
US - Michigan Exposure Limits for Air Contaminants	4,4'-diaminostilbene-2,2'-disulfonic acid (Particulates not otherwise regulated, Respirable dust)		5						
Canada - Prince Edward Island Occupational Exposure Limits	4,4'-diaminostilbene-2,2'-disulfonic acid (Particles (Insoluble or Poorly Soluble) [NOS] Inhalable particles)		10						See Appendix B current TLV/BEI Book

ENDOELTABLE

**PERSONAL PROTECTION**



**RESPIRATOR**

BR2

BR4

Consult your EHS staff for recommendations

#### EYE

- Chemical goggles.
- Full face shield.

#### HANDS/FEET

- Wear chemical protective gloves, eg. PVC.

NOTE: The material may produce skin sensitization in predisposed individuals. Care must be taken, when removing gloves and other protective equipment, to avoid all possible skin contact.

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.

#### OTHER

- Overalls.
- PVC Apron.

#### 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

Does not mix with water.

Sinks in water.

Corrosive.

Acid.

State	DIVIDED SOLID	Molecular Weight	370.41
Melting Range (°F)	>572	Viscosity	Not Applicable
Boiling Range (°F)	Not available	Solubility in water (g/L)	Partly miscible
Flash Point (°F)	Not available	pH (1% solution)	Not applicable
Decomposition Temp (°F)	>356	pH (as supplied)	Not applicable
Autoignition Temp (°F)	Not available	Vapour Pressure (mmHG)	<1.3 x 10 <sup>-5</sup> (25 C)
Upper Explosive Limit (%)	Not available.	Specific Gravity (water=1)	2.45
Lower Explosive Limit (%)	Not available	Relative Vapor Density (air=1)	>1
Volatile Component (%vol)	Negligible	Evaporation Rate	Not available

### APPEARANCE

Off-white or yellow crystalline solid; does not mix well with water (32 mg/l, 25 C). Soluble in alcohol, ether. Forms crystalline salts with many bisquaternary ammonium bases.

## Section 10 - CHEMICAL STABILITY

### CONDITIONS CONTRIBUTING TO INSTABILITY

- Contact with alkaline material liberates heat.
- Presence of incompatible materials.
- Product is considered stable.

### STORAGE INCOMPATIBILITY

- Reacts with mild steel, galvanized steel / zinc producing hydrogen gas which may form an explosive mixture with air.
- Segregate from alkalis, oxidizing agents and chemicals readily decomposed by acids, i.e. cyanides, sulfides, carbonates.
- Avoid strong bases.

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

## Section 11 - TOXICOLOGICAL INFORMATION

4,4'-DIAMINOSTILBENE-2,2'-DISULFONIC ACID

### TOXICITY AND IRRITATION

4,4'-DIAMINOSTILBENE-2,2'-DISULFONIC ACID:

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

#### TOXICITY                      IRRITATION

Oral (g.pig) LD50: 47000 mg/kg   Nil Reported

Oral (Rat) LD50: >5000 mg/kg \*

■ Contact allergies quickly manifest themselves as contact eczema, more rarely as urticaria or Quincke's edema. The pathogenesis of contact eczema involves a cell-mediated (T lymphocytes) immune reaction of the delayed type.

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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.

#### For 4,4'-diaminostilbene-2,2'-disulfonic acid (DASDS):

Acute toxicity: The acute oral LD50 value of DASDS for male Wistar rat was reported to be over 5,000 mg/kg. No data are available on acute inhalation and acute dermal toxicity. Two reports on irritation tests are available. The results indicate that DASDS is not irritating to skin and eyes in rabbit

Genotoxicity: DASDS showed no genotoxic effects in bacteria and chromosomal aberration test in vitro.

Repeat dose toxicity: In a NTP chronic toxicity test using rats and mice, there were no biologically significant absolute or relative organ weight, clinical pathological, or histopathological findings in rat or mice. Mean body weights were marginally decreased for high dose male and female rats and female mice. Food consumption in dosed rats and mice was similar to food consumption in the controls throughout the studies. Survival was similar among control and treated groups of rats and mice. Ulcers of the forestomach or glandular stomach occurred in dosed rats (males: 1/50, 5/50, 4/50, females: 0/50, 1/50, 4/50). The NOEL is estimated to be less than 558 mg/kg/day in rats for repeated dose toxicity.

Reproductive and developmental toxicity: In a combined repeat dose and reproductive/developmental toxicity screening test, parental animals exhibited no effects on reproductive parameters and there were no significant differences in number of offspring, sex ratio, etc. and no abnormal findings in the offspring. Therefore, the NOEL was estimated to be 1000 mg/kg/day for reproductive toxicity.

\* SIDS Initial Assessment Report 1996

## Section 12 - ECOLOGICAL INFORMATION

This material and its container must be disposed of as hazardous waste.

### Ecotoxicity

Ingredient	Persistence: Water/Soil	Persistence: Air	Bioaccumulation	Mobility
4,4'-diaminostilbene- 2,2'-disulfonic acid	HIGH		LOW	MED

## Section 13 - DISPOSAL CONSIDERATIONS

### US EPA Waste Number & Descriptions

A. General Product Information

Corrosivity characteristic: use EPA hazardous waste number D002 (waste code C)

### Disposal Instructions

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

! Puncture containers to prevent re-use and bury at an authorized landfill.

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

DOT:

Symbols: None Hazard class or Division: 8

Identification Numbers: UN3261 PG: II

Label Codes: 8 Special provisions: IB8, IP2,

IP4, T3,

TP33

Packaging: Exceptions: 154 Packaging: Non- bulk: 212

Packaging: Exceptions: 154 Quantity limitations: 15 kg

Passenger aircraft/rail:

Quantity Limitations: Cargo 50 kg Vessel stowage: Location: B aircraft only:

Vessel stowage: Other: None

Hazardous materials descriptions and proper shipping names:

Corrosive solid, acidic, organic, n.o.s.

### Air Transport IATA:

ICAO/IATA Class: 8 ICAO/IATA Subrisk: None

UN/ID Number: 3261 Packing Group: II

Special provisions: A3

Cargo Only

Packing Instructions: 816 Maximum Qty/Pack: 50 kg

Passenger and Cargo Passenger and Cargo

Packing Instructions: 814 Maximum Qty/Pack: 15 kg

Passenger and Cargo Limited Quantity Passenger and Cargo Limited Quantity

Packing Instructions: Y814 Maximum Qty/Pack: 5 kg

Shipping Name: CORROSIVE SOLID, ACIDIC, ORGANIC, N.O.S.

\*(CONTAINS 4,4'-DIAMINOSTILBENE-2,2'-DISULFONIC ACID)

### Maritime Transport IMDG:

IMDG Class: 8 IMDG Subrisk: None

UN Number: 3261 Packing Group: II

EMS Number: F-A , S-B Special provisions: 274

Limited Quantities: 1 kg

Shipping Name: CORROSIVE SOLID, ACIDIC, ORGANIC, N.O.S.

## Section 15 - REGULATORY INFORMATION

### 4,4'-diaminostilbene-2,2'-disulfonic acid (CAS: 81-11-8) is found on the following regulatory lists;

"Canada Domestic Substances List (DSL)", "OECD Representative List of High Production Volume (HPV) Chemicals", "US EPA High Production Volume Chemicals 1994 List of Additions", "US EPA Master Testing List - Index I Chemicals Listed", "US Toxic Substances Control Act (TSCA) - Inventory"

## Section 16 - OTHER INFORMATION

### LIMITED EVIDENCE

- Cumulative effects may result following exposure\*.

\* (limited evidence).

### ND

Substance CAS Suggested codes 4, 4' - diaminostilbene- 2, 2' - 81- 11- 8 disulfonic acid

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- 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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