Daminozide -MATERIAL SAFETY DATA SHEET

Manufacturer/information service:

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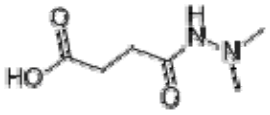
1. Chemical Product Identification

Product Name: Daminozide

Molecular Formula: $C_6H_{12}N_2O_3$

Structural Formula:



Molecular Weight: 160.17

Chemical Name: *N*-(dimethylamino)succinamic acid (IUPAC)

CAS No.: 1596-84-5

2. Composition / Information On Ingredients

Composition	CAS No.	Content %
Daminozide	1596-84-5	85.0
Other ingredients		15.0

3. Hazards Identification

Component	Symbol	R phrases
Daminozide	Xn	R40

More important danger for the man: May cause moderate irritation to eyes;

Dangers for the environment: Low toxicity to terrestrial wildlife;

Physical-chemical dangers: Not applicable

4. First Aid Measures

If poisoning occurs, immediately contact a doctor or Poisons Information Centre, and follow the advice given. Show this Material Safety Data Sheet to a doctor.

Eye: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for further treatment advice.

Skin: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.

Ingestion: Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by the poison control center or doctor. Do not give anything by mouth to an unconscious person.

Inhalation:Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. Call a poison control center or doctor for further treatment advice.

Note to physician: No specific antidote known. Treat symptomatically.

5. Fire-Fighting Measures

Extinguishing media: Dry chemical, foam, CO2, water fog;

Don’t use: water spray ;

Particular risk: not applicable;

Measures of personal protection: Safety glasses or goggles, rubber gloves, shoes plus socks, long-sleeved shirt, and long pants.

Hazardous combustion products : Irritating fumes. Oxides of carbon. Oxides of nitrogen.

6. Accidental Release Measures

Personal cautions: safety glasses or goggles, rubber gloves, shoes plus socks, long-sleeved shirt, and long pants. Avoid contact with eyes and skin.

Cleaning methods

EX: Clean up spill immediately. Sweep up and collect in a suitable container for disposal.Avoid dust formation.

Environmental cautions

EX: Prevent from entering sewer system, surface water or s oil

7. Handling And Storage

Handling: Avoid getting in eyes or on skin, or clothing and breathing dust. Remove contaminated clothing immediately. Wash thoroughly after handling.

Storage: Keep in original container. Do not store or transport near food or feed. Do not contaminate food or feed. Do not put concentrate into food or drink containers. Do not dilute concentrate in food or drink containers. Store in a cool, dry place, out of direct sunlight.

Fire and explosion protection: the area must be far from fire and flammable materials.

8. Exposure Controls / Personal Protection

Personal protective equipment

Respiratory protection: A respirator approved for dust/fume or mist protection is recommended for mists, sprays or aerosols., The determination of appropriate respiratory protection is best performed, on a case by case basis, taking into consideration the exposure conditions of the particular operation;

Protective gloves: rubber gloves;

Eye protection: goggles;

Industrial hygiene: use good industrial hygiene. Wear face shield or goggles, elbow length PVC gloves, cotton overalls buttoned to the neck and wrist, washable hat and half face respirator with dust and vapor cartridge. After use and before eating, drinking or smoking, wash hands, arms and face thoroughly with soap and water.

Ventilation

If personnel exposure exceeds exposure limits, apply local exhaust ventilation at points of dust generation.

9. Physical And Chemical Properties

Appearance: White flowable solid granule;

Boilting point: Not available;

Melting point: > 120 °C;

Bulk Density: 740 g/cm^3;

Water solubility: 100 g/l (20℃);

Flash point: Not available;

Autoignition Temperature: Not available

Suspensibility: ＞90.0%

pH(1% aqueous solution): 3.0-6.0

10. Stability And Reactivity

Stability: stable under the normal conditions;

Conditions to avoid: Fire, heat and high temperature;

Products to avoid: Incompatible with Oxidizing agents, Strong acids, Strong bases.;

Hazardous combustion products: Irritating fumes, Oxides of carbon, Oxides of nitrogen.

Hazardous polymerization: Will not occur.

11. Toxicological Information

Acute oral LD_{50} for rat: ＞5000 mg/kg;

Acute dermal LD_{50} for rat: ＞5000 mg/kg;

Inhalation LC_{50} (4h) for rabbits: ＞147mg/l;

Non irritating to rabbit skin;

Severe eye irritant to rabbit eye;

Dermal sensitization: Not a sensitizer (Guinea pig).

Chronic toxicity: The NOEL for a 2-year study with rats fed 5, 25, 250 or 500 mg/kg/day was 5 mg/kg. Effects observed at higher doses included atrophy of ovaries and enlargement of the liver bile duct (hyperplasia). No effects were seen in dogs fed 7.5, 75 or 187.5 mg/kg/day daminozide for one year .

The principal health concern related to use of daminozide is the carcinogenic potential of UDMH, a contaminant and metabolite of daminozide.

Reproductive effects: A 3-generation study with rats fed 300 mg/kg showed no significant effects on fertility or reproductive capacity. The reproductive NOEL for a 2-generation study with rats fed 5, 50 or 500 mg/kg/day was 5 mg/kg/day

Teratogenic effects: No birth defects occurred in the offspring of pregnant rats fed 500 mg/kg/day, the highest dose tested. When pregnant rats were given 85, 390 or 1,800 mg/kg/day, ossification of the bones of the sternum and spine occurred in offspring at 1,800 mg/kg/day. The reproductive NOEL for this study was 390 mg/kg/day. No teratogenic or developmental effects occurred in the offspring of pregnant rabbits given 50, 150 or 300 mg/kg/day.

Mutagenic effects: Several studies have shown that daminozide is not mutagenic in either in vivo or in vitro tests. There is inconclusive evidence that UDMH may be mutagenic. Dimethylnitrosamine (DMN), another metabolite of daminozide, is mutagenic.

Carcinogenic effects: Unsymmetrical dimethyl hydrazine (UDMH) is a contaminant of commercial daminozide and a metabolite of daminozide which is formed in the body, during food processing, or when spray mixes containing daminozide are left standing in the mixing tank. Both daminozide and UDMH have caused increases in the incidence of benign and malignant tumors in test animals. Malignant tumors were found in female rats given dietary doses of 5000 and 10,000 ppm. Malignant and benign blood vessel tumors also occurred in treated mice .

EPA has classified daminozide and its metabolite UDMH as probable human carcinogens based on the occurrence of tumors in laboratory animals.

No increase in tumor formation occurred in rats fed 5, 25, 250 or 500 mg/kg/day of daminozide for two years, nor in mice fed 15, 150, 300 or 500 mg/kg/day for 2 years.

When rats were given UDMH in their drinking water at concentrations of 0, 1, 50 or 100 ppm for 2 years, there was a significant, but slight, dose- related increase in liver tumors in females, and bile duct hyperplasia and inflammation of the liver in males receiving 100ppm and in females receiving 50 and 100ppm.

Mice given UDMH in their drinking water for 2 years at 0, 1, 5 or 10ppm for males and 0, 1, 5 or 20ppm for females exhibited decreased survival at the highest dose tested. This study also showed a significant increase in the incidence of lung tumors.

In another study, mice given UDMH in their drinking water for two years at 0, 40 or 80ppm exhibited a significant increase in the incidence of lung and vascular tumors

12. Ecological And Ecotoxicological Information

Effects on birds:

LD_{50} (96h)for quail: 5620mg/kg;

LD_{50} (8 days)for mallard ducks: 1000 mg/kg;

Effects on aquatic organisms:

LC_{50} (96h) for rainbow trout: 149 mg/l;

LC50(96h) for Bluegill:423 mg/l;

EC_{50} (48h) for daphnia magna: ＞99 mg/l.

LC50(72h) for Algae: 160 mg/l;

Effects on other organisms:

Daminozide is of low toxicity to terrestrial wildlife.

It is non- toxic to bees

13. Disposal Considerations

Material that cannot be used at the site should be disposed of in an approved waste disposal facility following all applicable Federal, State and Local regulations. If burned, stay out of smoke. Do not contaminate water supplies by disposal of wastes or containers.

14. Transport Information

Not applicable.

15. Regulatory Information

Not applicable.

16. Other Information

All information and instructions provided in this Material Safety Data Sheet (MSDS) are based on the current state of scientific and technical knowledge at the date indicated on the present MSDS and are presented in good faith and believed to be correct. This information applies to the product as such. In case of new formulations or mixes, it is necessary to ascertain that a new danger will not appear. It is the responsibility of persons on receipt of this MSDS to ensure that the information contained herein is properly read and understood by all people who may use, handle, dispose or in any way come in contact with the product. If the recipient subsequently produce formulations containing this product, it is the recipients sole responsibility to ensure the transfer of all relevant information from this MSDS to their own MSDS.