



Material Safety Data Sheet

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Infosafe No. AE16B Issue Date : May 2003 ISSUED by AMTRADE

Product Name : **DL-MALIC ACID**

Classified as hazardous according to criteria of NOHSC

COMPANY DETAILS

Company Name Amtrade International Pty Ltd (ABN 49 006 409 936)
Address Level 6, 574 St Kilda Road
Melbourne
VIC. 3004 Australia
Emergency Tel. 1800 033 111 Aust
Tel/Fax Tel: 61 3 9229 9229 Fax: 61 3 9229 9290

IDENTIFICATION

Product Name DL-MALIC ACID
Proper Shipping Name None Allocated
Other Names Name Product Code
dl-Malic Acid 25kg 321394
.
1-Hydroxyethane-1,2-Dicarboxylic Acid;
Hydroxy-Butanedioic Acid;
2-Hydroxy-Succinic Acid;
Malic Acid;
Apple Acid.
UN Number None Allocated
DG Class None Allocated
Packing Group None Allocated
Hazchem Code None Allocated
Poisons Schedule Not Scheduled
Product Use Preparation of flavouring extracts, confections, soft drinks, effervescent salts; acidifier; dispersing agent; medicines; acidulant and anti-oxidant in foods. Used in wine manufacture. Used as a chelating agent.
(Caution - Do not confuse with Maleic Acid)

Physical Data

Appearance White crystalline granular powder, strongly acid taste. It will slowly absorb moisture from the air (slightly hygroscopic).
Melting Point 127-133°C
Boiling Point Decomposes before boiling at 140-150°C.
Vapour Pressure <0.1 mm Hg at 20°C
Specific Gravity 1.6-1.7 at 20°C
Flash Point 203-220°C
Flamm. Limit LEL May form an explosive organic dust cloud in air.

Other Properties

Volatile Component Nil
Autoignition Temp. 349°C
Vapour Density 4.6 (air=1)
pH Value 2.35 (1% solution)
Form Solid
Decomposition Temperature 140-150°C
Formula HOOC-CH(OH)CH₂-COOH or C₄-H₆-O₅
Molecular Weight 134.1



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Other Information SOLUBILITY: Very soluble in water (565 g/1000 g of water at 20°C).
Soluble in alcohol.
Slightly soluble in ether. Insoluble in benzene.
ACID DISSOCIATION CONSTANTS: pKa1 = 3.40, pKa2 = 5.05 (Patty 4th Ed. 1994)

Ingredients

| Ingredients | Name | CAS | Proportion |
|-------------|-----------------------------------|------------|-------------|
| | Malic Acid (DL) | 617-48-1 * | >99.5% |
| | Fumaric acid | 110-17-8 | 0.3-1 % |
| | Maleic acid | 110-16-7 | 0.01-0.05 % |
| | Moisture | 77321-18-5 | 0.2-0.4 % |
| | * There is an alternative CAS No. | | |
| | Malic Acid | 6915-15-7 | >99.5% |

Other Information Commercial Malic Acid is a racemic mixture (DL-Malic Acid).

HEALTH HAZARD INFORMATION

Health Effects

Acute - Swallowed Not harmful in small amounts. May be harmful if large amounts are accidentally swallowed.

Acute - Eye Severely irritating to the eyes.

Acute - Skin Moderately irritating to the skin.

Acute - Inhaled Irritating when inhaled. May be harmful if large amounts are inhaled.

Chronic May cause irritation.

Other Information No accounts of toxicity in industrial use have been reported. Malic acid is constituent of the human diet because of its presence in many edible plants and fruits (especially) apples and in wine. It is rapidly metabolised when eaten to pyruvic acid, and is ultimately eliminated as carbon dioxide.

First Aid

Swallowed Rinse mouth with water. Give plenty to drink. If vomiting occurs give further water. Seek medical advice.

Eye Irrigate with copious quantities of water for 15 minutes. In all cases of eye contamination it is a sensible precaution to seek medical advice.

Skin Wash contaminated skin with plenty of water. If irritation occurs, seek medical advice.

Inhaled Remove victim to fresh air. Keep at rest. Seek medical advice if effects persist.

First Aid Facilities Eye wash station and safety shower, plus normal washroom facilities nearby.

Advice to Doctor

Advice to Doctor Treat symptomatically.

Other Health Hazard Information

PRECAUTIONS FOR USE

Exposure Limits Nuisance Dust 10 mg/m³ TWA.

Eng. Controls Normal dilution ventilation. Avoid generating and inhaling dusts. If dust clouds are formed, or created inside equipment, remove all ignition sources and ground if necessary to stop buildup of static charges that may generate a spark and cause an organic dust explosion.

Personal Protection



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Protective Equip. Avoid eye contact and repeated or prolonged skin contact.
Wear impervious gloves (e.g. plastic or rubber).
Wear protective overalls.
Wear safety glasses with side shields or chemical goggles.
Provide local exhaust ventilation or wear a dust respirator meeting AS1715/1716, when dust clouds formed may cause an inhalation hazard and/or ventilation is not adequate.
Always wash hands before smoking, eating, drinking or using the toilet.

Flammability

Fire Hazards Combustible organic powder. Dusts may form an explosive organic dust cloud. Will burn under fire conditions.

SAFE HANDLING INFORMATION

Storage and Transport

Storage and Transport Keep dry. Store away from alkalis and oxidizing agents. Store away from heat and naked flames. Keep containers closed when not in use.
Not defined as a Dangerous Good: by the Australian Code for the Transport of Dangerous Goods by Road & Rail; by the IATA Air Transport Dangerous Goods Regulations; or by the IMDG (International Maritime Dangerous Goods) Code.

Proper Shipping Name None Allocated

Spills and Disposal

Spills & Disposal SPILLAGE: Wear appropriate protective clothing. Sweep up, but avoid generating a dust cloud. Put into clean labelled containers for recycling or disposal. Wash away any remaining residues with water.
DISPOSAL: In accordance with Local, State & Federal EPA waste regulations. Advise its irritant nature. Neutralise before disposing to sewer.
The powder can be incinerated in an approved facility.

Fire/Explosion Hazard

Fire/Explos. Hazard Malic acid is a combustible organic powder. Therefore any accumulation of dust could form an explosive organic dust cloud in air.
EXTINGUISHING MEDIA: Any for the surrounding area (e.g. regular dry chemical, water, regular foam, carbon dioxide).
For LARGE fires, use regular foam or flood with fine water spray.
SPECIAL PROCEDURES: Move containers from the fire area if it can be done safely. Do not spread any spilled powder with water streams. Dike for later recovery and disposal.

Hazardous Reaction Indefinitely stable, at room temperature, in the original unopened and sealed container. Once the container has been opened malic acid will start being oxidised to oxaloacetic acid. Use containers which have been opened, within 6 months. 50% stock solutions in water can be readily prepared for use at room temperature.
CONDITIONS TO AVOID: Avoid forming an organic dust cloud explosion. Avoid heat, flames, sparks and other sources of ignition.
INCOMPATIBLE MATERIALS: Oxidizing agents, alkalis, alkali metals, amines. Unsuitable container materials - iron, zinc, aluminium. Aqueous solutions of Malic Acid can release explosive hydrogen gas if in contact with these active metals.
HAZARDOUS DECOMPOSITION PRODUCTS: Carbon monoxide.
HAZARDOUS POLYMERISATION: Will not occur.

Hazchem Code None Allocated

OTHER INFORMATION



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Toxicology Acute Oral Toxicity LD50 (rat) : 3200 mg/kg (Eastman Kodak 1981)
Acute Oral Toxicity LD50 (mouse): 1600-3200 mg/kg (Eastman Kodak 1981)
No cumulative effects have been reported following repeated exposures to malic acid (Patty, 4th Edition, 1994).
Malic acid showed no teratogenic effects in the developing chicken embryo (Patty, 4th Ed. 1994).
Malic acid did not induce mutations in the Ames test (Patty, 4th Ed. 1994).

Environ. Protection Readily biodegradable.
Octanol / Water Partition Co-efficient: log Po/w = -1.26

Pkg. & Labelling Workplace Hazardous Substance.
HAZARD CATEGORY: IRRITANT
R36/37/38 - Irritating to eyes, respiratory system and skin.
S24/25 Avoid contact with skin and eyes.
S37/39 Wear suitable gloves and eye/face protection.
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 water.
Not a Dangerous Good or Scheduled Poison.

User Codes

| | <u>User Code</u> |
|----------------------|------------------|
| Prepared by | JS0305-B |
| Authorised by | D.Latta |
| NZ Schedule Poison S | - |

Empirical Formula & Structural Formula HOOC-CH(OH)CH₂-COOH or C₄-H₆-O₅

CONTACT POINT

Contact For EMERGENCIES ONLY Contact : 1800 033 111 (All Hours Australia)
0800 734 607 (All Hours New Zealand)

Amtrade International Pty Ltd: 61 3 9229 9229 (Melbourne)
61 2 9805 4200 (Sydney)
Amtrade New Zealand Limited : 64 9 579 6767 (Auckland)

NOTE: This MSDS summarises our best knowledge of the health and safety hazard information on the product, and how to safely handle and use the product in the workplace. Each user should read this MSDS and consider the information in the context of how the product will be handled and used in the workplace, including in conjunction with other products.

If clarification or further information is needed to ensure that an appropriate risk assessment can be made, the user should contact this company, or in the event of an emergency, the Emergency Response number above.

Our responsibility for products sold is subject to our standard terms and conditions, a copy of which is sent to our customers and is also available on request.

...End Of MSDS...