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Safety Data Sheet


1. Chemicals and Company Identification

Product name	DL- Malic Acid
Company name	Fuso Chemical Co., Ltd.
Address	4-3-10 Koraihashi, Chuo-ku, Osaka, Japan
Department in charge	Life Science Business Unit, Sales & Development Department
Tel	+81-6-6203-0052 Fax : +81-6-6203-0094
Emergency call	Ditto
Reference number	00Q001

2. Hazards Identification

GHS classification

Physical hazards	Explosives	: Not classified	
	Flammable gases	: Not classified	
	Aerosols	: Not classified	
	Oxidizing gases	: Not classified	
	Gases under pressure	: Not classified	
	Flammable liquids	: Not classified	
	Flammable solids	: Classification not possible	
	Self-reactive substances and mixtures	: Not classified	
	Pyrophoric liquids	: Not classified	
	Pyrophoric solids	: Not classified	
	Self-heating substances and mixtures	: Classification not possible	
	Substances and mixtures which, in contact with water, emit flammable gases	: Not classified	
	Oxidizing liquids	: Not classified	
	Oxidizing solids	: Not classified	
	Organic peroxides	: Not classified	
	Corrosive to metals	: Classification not possible	
	Desensitized explosives	: Not classified	
	Health hazards	Acute toxicity (Oral)	: Not classified
		Acute toxicity (Dermal)	: Classification not possible
		Acute toxicity (Inhalation: Gases)	: Not classified
Acute toxicity (Inhalation: Vapours)		: Classification not possible	
Acute toxicity (Inhalation: Dusts and mists)		: Classification not possible	
Skin corrosion/irritation		: Category 2	
Serious eye damage/eye irritation		: Category 2A	
Respiratory sensitization		: Classification not possible	
Skin sensitization		: Classification not possible	
Germ cell mutagenicity		: Classification not possible	
Environmental	Carcinogenicity	: Classification not possible	
	Reproductive toxicity	: Classification not possible	
	Specific target organ toxicity - Single exposure	: Classification not possible	
	Specific target organ toxicity - Repeated exposure	: Classification not possible	
	Aspiration hazard	: Classification not possible	
	Hazardous to the aquatic environment	: Classification not possible	

hazards	Short term (Acute) Hazardous to the aquatic environment : Classification not possible Long term (Chronic) Hazardous to the ozone layer : Classification not possible
GHS label	
Pictograms	
	
Signal word	Warning
Hazard statements	H315 Causes skin irritation H319 Causes serious eye irritation
Precautionary statements	[Safety measures] P264 Wash eye thoroughly after handling. P280 Wear protective gloves/protective clothing/eye protection/face protection. [First-aid measures] P302 + P352 IF ON SKIN: Wash with plenty of water / soap. P321 Specific treatment P332 + P313 If skin irritation occurs: Get medical advice / attention. P362 + P364 Take off contaminated clothing and wash it before reuse. P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P337 + P313 If eye irritation persists: Get medical advice/attention. [Disposal] Dispose of contents and containers by entrusting an industrial waste disposal company authorized by the prefectural governor in accordance with the relevant laws and regulations. Dispose of used containers properly without using them for any other purpose.
Other hazards	Avoid dust formation. In the case of fine powder, be careful when handling large quantities, as there may be a risk of dust explosion.

3. Composition/Information on Ingredients

Substance or Mixture	:	Substance
Ingredients and concentration range	:	DL-Malic acid Not less than 99.4%
Chemical substance name or common name	:	DL-Malic acid
Synonyms	:	Hydroxy succinic acid, 2-Hydroxy butanedioic acid
CAS No.	:	6915-15-7
MITI No.	:	(2)-1442
EINECS No.	:	230-022-8

4. First-aid Measures

Inhalation	:	Remove person to fresh air and keep comfortable for breathing. Get medical advice.
Skin contact	:	Rinse skin with water/shower and soap. If skin irritation occurs, get medical advice / attention. Take of contaminated clothing and wash before reuse.
Eye contact	:	Rinse carefully with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists, receive physician diagnosis/care.
Ingestion	:	Rinse mouth quickly and get medical attention.
Personal protective equipment for first-aiders:	:	Wear appropriate protective equipment such as protective gloves, protective clothing, protective glasses, face shield, respiratory

Special precautions to a physician : protection , and safety shoes.
: Treat according to the symptom.

5. Fire-fighting Measures

Suitable extinguishing media : Water, powder, carbon dioxide, foam, etc.
Extinguishing media which must not be used : Powder extinguishing agents containing alkali metals should not be used.
Specific hazards arising from the chemical : In the event of a fire, toxic gases such as carbon monoxide due to incomplete combustion may be produced.
Fire fighting measures : Remove nearby ignition sources and extinguish with protective gear.
Special protective equipment and emergency actions for fire-fighters : When extinguishing a fire, wear respiratory protective equipment to prevent toxic gases from being sucked in, and extinguish the fire from upwind.

6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures : Be sure to wear protective equipment (protective gloves, protective glasses, etc.) when working.
Environmental precautions : Be careful not to flow into public water areas.
Methods and materials for containment and cleaning up : In case of small spillage, wipe off and discard. When washing with water, neutralize with alkali carbonate or alkali bicarbonate, and then perform appropriate waste water treatment.
In case of large spillage, sweep and put it in a container with a lid, neutralize it with alkali carbonate or alkali bicarbonate, and then perform appropriate waste water treatment.

7. Handling and Storage

Handling

Technical countermeasures : After handling, wash the body, hands, mouth, eyes, and face carefully.
If it adheres to clothing, discard it, wash it thoroughly, and wear it.
Do not leak or splash.
Safety precautions : Avoid contact with skin, eyes, etc.
Work by wearing protective equipment such as acid-resistant gloves, acid-resistant front cover, and protective glasses (goggles, etc.).
Because fine powder may cause dust explosions, keep ignition sources away and work in well ventilated areas.
Contact avoidance : Wear appropriate protective equipment, if there is a risk of contact with eyes and skin.

Storage

Safety storage conditions : Store in a closed, ventilated, dry and dark place.
Safety containers and packaging materials : Polyethylene, polypropylene

8. Exposure Controls / Personal Protection

Occupational exposure limits

No data

Equipment measures : An eye washing facility is provided near the handling place, and the position is clearly indicated.
If the above facility is not provided in the work area, prepare a poly can or eye wash bin near the work area.

Protective equipment

Respiratory protection : Protective mask of air supply type, masks with a particle collection efficiency of 99.9% or higher according to national tests.
Hand protection : Acid-resistant gloves
Eye protection : Goggle-type protective glasses, eye washer

Skin and body protection : Protective front cover, etc.

9. Physical and Chemical Properties

Physical state : Crystalline powder
 Colour : Colourless ~ white
 Odour : Odourless or slightly peculiar odour
 Melting point/ freezing point : 127°C ~ 132°C
 Boiling point or initial boiling point and boiling range : 150°C
 Flammability : No data
 Lower and upper explosion limit / flammability limit : No data
 Flash point : 203°C
 Auto-ignition temperature : No data
 Decomposition temperature : No data
 pH : 2.2 (1^{w/w}%pH)
 Kinematic viscosity : -
 Solubility : Water 55.8% (20°C), 60.8% (30°C), 90.0% (100°C),
 Organic solvents : methanol 82.7% (20°C), ethanol 45.5% (20°C), ethyl ether 0.84% (20°C), acetone 17.8% (20°C)
 Partition coefficient n-octanol/water (log value) : -1.26
 Vapour pressure : No data
 Density and/or relative density : Absolute specific gravity 1.61 g/cm³
 Relative vapour density : No data
 Particle characteristics : No data
 Molecular weight : 134.09

10. Stability and Reactivity

Reactivity : Reacts violently with concentrated alkalis and generates heat. Reacts with chlorine-based bleach to generate harmful chlorine gas, so do not allow it to come into contact with it.
 Chemical stability : Stable under normal handling and storage conditions
 Possibility of hazardous reactions : No data
 Conditions to avoid : Do not allow contact with alkali (base), chlorine-based bleach
 Incompatible materials : Alkali, chlorine-based bleach, metals such as aluminum
 Hazardous decomposition products : No data

11. Toxicological Information

Acute toxicity : (Oral)
 From an LD₅₀ value of >3200 mg/kg bw for rats (PATTY (5th, 2001)), it is classified as "Not classified" in JIS classification (Category 5 or "Not classified" in UN GHS classification).
 (Dermal)
 There are no suitable data and cannot be classified.
 (Inhalation: Gases)
 Not classified as a solid in the definition of GHS.
 (Inhalation: Vapours)
 There are no suitable data and cannot be classified.
 (Inhalation: Dusts and mists)
 There are no suitable data and cannot be classified.

Skin corrosion/irritation	:	On the basis of moderately irritating reported as a result of a test applied 20 mg or 500 mg to rabbit skin for 24 hours (PATTY (5 th , 2001)), it is classified in Category 2.
Serious eye damage/eye irritation	:	On the basis of severe irritation reported as a result of a test applied 750 µg to rabbit eyes (PATTY (5 th , 2001)), it is classified in Category 2A.
Respiratory sensitization	:	There are no suitable data and cannot be classified.
Skin sensitization	:	There are no suitable data and cannot be classified.
Germ cell mutagenicity	:	There are no suitable data and cannot be classified.
Carcinogenicity	:	There are no suitable data and cannot be classified.
Reproductive toxicity	:	There are no suitable data and cannot be classified.
Specific target organ toxicity (Single exposure)	:	There are no suitable data and cannot be classified.
Specific target organ toxicity (Repeated exposure)	:	There are no suitable data and cannot be classified.
Aspiration hazard	:	There are no suitable data and cannot be classified.

12. Ecological Information

Toxicity	:	Hazardous to the aquatic environment Short term (Acute) There are no suitable data and cannot be classified. Hazardous to the aquatic environment Long term (Chronic) There are no suitable data and cannot be classified.
Persistence and degradability	:	COD _(Mn) 0.551 g/g BOD 0.08 g/g
Bioaccumulative potential	:	There are no suitable data and cannot be classified.
Mobility in soil	:	There are no suitable data and cannot be classified.
Hazardous to the ozone layer	:	This substance is not listed in the Annexes to the Montreal Protocol. Therefore, it cannot be classified. .

13. Disposal Considerations

Information for proper disposal, recycling or reclamation of the substance and/or its container	:	Neutralize with alkali carbonate or alkali bicarbonate, and treat following the requirements of the law. When the product is to be disposed of, it shall be contracted to an industrial waste disposal contractor, or shall be diluted more than 50 times with water, neutralized with alkali carbonate or alkali bicarbonate, and treated following the regulations of the law. Containers should be cleaned and recycled or properly disposed of following relevant laws and local regulations as well as local municipal standards. When discarding empty containers, remove contents completely.
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14. Transport Information

International regulations

UN No.	:	Not applicable
UN Classification	:	Not applicable
Marine Pollutant	:	Not applicable

Domestic regulations

Land transport	:	Follow the provisions of the Road Traffic Act.
Marine transport	:	Follow the provisions of the Ship Safety Act.
Air transport	:	Follow the provisions of the Civil Aeronautics Act.
Specific measures for safety and condition of transportation	:	Make sure that there is no leakage from the container, and load so that there is no fall, drop, or damage, to ensure prevention of collapse of the load.

Regulatory information where domestic regulations exist : Not applicable

15. Regulatory Information (in Japan)

Food Sanitation Act : Food additive

Pay attention to the laws and regulations of the area where the product is used.

16. Other Information

References : NITE GHS Classification result.
Japanese Ministry of Health, Labour and Welfare
PubChem
JIS Z 7252 : 2019
JIS Z 7253 : 2019

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. In addition, new findings and revisions to previous theories may cause changes in the content. If it is used for important decisions, it is recommended that the exhibition be thoroughly reviewed or verified through tests. Values such as content and physicochemical properties are not guaranteed. In addition, precautions are for normal handling. If special handling is required, take this point into consideration.