

MATERIAL SAFETY DATA SHEET**SDS / MSDS**

Product Name: FUMARIC ACID

Revision Date: 05.01.2024

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1. Manufacturer and Substance Identification

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Chemical Name : FUMARIC ACID
CAS Number : 110-17-8
EC Number : 203-743-0
Molecular Formula : C₄H₄O₄
Molecular Weight : 116.07
Synonyms : Trans-2-butenedioic acid, (E)-Butenedioic acid , 2-butenedioic acid

Identified uses : Used as Technical additives, Chemical preservatives. Additive used for processing in food & feed industry. Used in protective coatings, dyestuff, adhesives, polymer & resins, pharmaceutical applications and for laboratory use

2. Hazard Identification**2.1. Classification of the substance or mixture**

Classification according to Regulation (EC) No 1272/2008

For Physico-Chemical properties : Not Classified

For Human health hazards

1. Acute Toxicity oral : Not Classified
2. Skin corrosion / irritation : Not Classified
3. Serious damage / eye irritation : Category 2, H319
4. Respiration sensitization : Not Classified
5. Skin sensitization : Not Classified
6. Specific target Toxicity single (SPOT) : Not Classified

For Environmental hazards : Not Classified

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2.2. Label elements

Labeling according to Regulation (EC) No 1272/2008

Hazard pictogram:



Signal word : **Warning**

Hazard statement:

H319 : Causes serious eye irritation

Precautionary statement(s):

P264 - Wash hands thoroughly after handling.

P280 - Wear Protective gloves / protective clothing / eye protection / face protection

P305 + P 351 + P 338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P337 + P 313: If eye irritation persists: Get medical advice / attention

3. Composition /Information on ingredients

<u>Chemical Name</u>	<u>CAS No.</u>	<u>Content (W/W)</u>	<u>EINECS</u>
Fumaric acid	110-17-8	More than 99.5 %	203-743-0
Maleic Acid	110-16-7	Less than 0.05 %	203-742-5

4. First Aid Measures

Inhalation : Remove to fresh air and keep at rest. Monitor respiratory function. If breathing is difficult, give oxygen. If necessary, give artificial respiration.

Skin Contact : Remove contaminated clothing and shoes. Wash with plenty of soap and water. If irritation develops, seek medical attention.

Eye Contact : In case of contact with the eyes, Rinse cautiously with water for several Minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Ingestion : Rinse mouth of victim with plenty of water. Do NOT induce vomiting. Never give anything by mouth to an unconscious person

Other : Seek Medical attention

Movement of the exposed individual from the area to fresh air is recommended
Personal protective equipment for first aid responders is recommended

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5. Fire Fighting Measures

- Explosive Hazard : This material may form flammable dust-air mixtures when finely divided. Prevent dust build-up by providing adequate ventilation.
- Means of Extinction : Carbon dioxide (CO₂) foam, dry powder, sand for small fires. For Large fires use water jet, or alcohol resistant foam.
- Hazardous Combustion Products: Toxic fumes of carbon monoxide, carbon dioxide.
- Protection of Firefighters : The fire fighters should wear full protective equipment and self-contained breathing apparatus with full face piece operated in positive pressure mode

6. Accidental Release Measures

- Personal precautions : Avoid Inhalation. Use personal protective equipment (gloves, safety goggles and protective clothing). Ensure adequate ventilation.
- Environmental precautions : Remove all sources of ignition. Avoid discharge into environment
- Methods for cleaning up : Use mechanical handling equipment. Avoid raising dust. Flush with plenty of water. Dispose of in compliance with local and national regulations.

7. Handling and Storage

Handling

- General advice : Avoid inhalation, contact with skin and eyes. Do not handle near incompatible materials. Use proper personal protective equipment. Wash hands thoroughly after handling. Do not eat, drink or smoke when using this product. Wash hands before eating, drinks, smoking or going to the toilet. Take off all contaminated clothing and wash before reuse.
- Protection against fire and explosion : Avoid dust formation. Dust can form an explosive mixture with air. Prevent electrostatic charge - sources of ignition should be kept well clear - fire extinguishers should be kept handy. Electrical devices must meet the specified temperature class.

Storage

- General advice : Fumaric Acid is slightly inflammable. Store away from alkaline materials, oxidizers and strong acids. Copper oxide, nitric acid and sulfuric acid, sodium nitrite. Avoid static electricity discharges. Keep in original container, in a cool dry, well-ventilated place. Keep away from food. Store locked up, keep out of reach of children.
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8. Exposure Controls / Personal Protection

National Occupational exposure limits: None assigned

Engineering measures	: Ensure adequate ventilation, Well grounded protected electrical equipment.
Respiratory	: Self contained breathing apparatus
Eye	: Closely fitted Safety goggles.
Protection of Hand	: Gloves are advised for repeated or prolonged contact. Material of gloves Nitrile rubber, NBR Butyl rubber, BR Neoprene gloves Natural rubber, NR
Skin and body	: Approved work boots, protective clothing
Hygiene measure	: Wash hands during break and at the end of the work
Other devices	: Maintain eye wash facility in work area

9. Physical and Chemical Properties

Form	: Powder
Colour	: White
Odour	: odorless
Odour threshold	: No data
pH	: Acidic
Melting Point/ Freezing point °C	: 287
Boiling Point °C	: 200
Relative Density at 20° C	: 1.635
Vapor Density	: No data
Vapor Pressure mmHg at 25° C	: 1.54 X10 ⁻⁴
Flash Point °C	: Not Applicable -Solid
Evaporation Rate	: No data
Flammability	: Not Classified as Flammable
Upper/Lower Flammability Limited	: Not Applicable
Solubility in water g/L at 25° C	: 7
Solubility in other Solvents	: No data
Partition Co-efficient	: Log Kow 0.46
Auto ignition Temperature	: Not Applicable
Decomposition Temperature	: No Decomposition Reported below Boiling Point
Viscosity	: Not Applicable
Explosive properties	: Not classified as Explosive
Oxidizing properties	: Not classified as Oxidizing

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10. Stability and Reactivity

Stability	: Stable at normal temperatures and pressures.
Conditions to Avoid	: Temperatures over 190°C and moisture.
Materials to Avoid	: Strong oxidants, strong bases, alkali metals, amines, and carbonates.
Hazardous Decomposition Products:	Maleic Acid, Maleic Anhydride, Carbon Monoxide, and Carbon Dioxide.
Reactivity	: Stability and reactivity of Fumaric acid is not considered Critical.

11. Toxicological Information

Acute toxicity	: LD ₅₀ (oral, rats) : 10700 mg/kg : LC ₅₀ (inhalation, rats) : 1.306 mg/L : LD ₅₀ (dermal, rats) : 20000 mg/kg bw
Skin corrosion/irritation	: Mildly irritating to the skin
Serious eye damage/irritation	: Irritating to eyes.
Respiratory or skin sensitisation	: Not Sensitizing
Repeated dose toxicity	: NOAEL: 600 mg/kg bw/day
Germ cell mutagenicity	: Not Mutagenic
Carcinogenicity	: Non carcinogenic
Reproductive toxicity	: Non toxic to reproduction.

IARC (International Agency for Research on Cancer):
Substance is not listed.

NTP (National Toxicology Program):
Substance is not listed.

OSHA-Ca (Occupational Safety & Health Administration):
Substance is not listed.

Probable route(s) of exposure:

Ingestion.

Inhalation.

Eye contact.

Skin contact.

- **Acute effects (acute toxicity, irritation and corrosivity):** Causes serious eye irritation.
- **Germ cell mutagenicity:** Based on available data, the classification criteria are not met.
- **Carcinogenicity:** Based on available data, the classification criteria are not met.
- **Reproductive toxicity:** Based on available data, the classification criteria are not met.
- **STOT-single exposure:** Based on available data, the classification criteria are not met.
- **STOT-repeated exposure:** Based on available data, the classification criteria are not met.
- **Aspiration hazard:** Based on available data, the classification criteria are not met.

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12. Ecological Information

Toxicity

Aquatic Toxicity

Short-term toxicity to fish

Brachydanio rerio (new name: Danio rerio)/fresh water/semi-static LC50 (96 hrs):

>100 mg/L test mat

Long-term toxicity to fish: No hazard was identified

Short-term toxicity to aquatic invertebrates

Daphnia magna/fresh water/static EC50 (48 h): 100 mg/L test mat.

Long-term toxicity to aquatic invertebrates: No hazard was identified

Algae and aquatic plants

Pseudokirchnerella subcapitata (algae)/freshwater/static NOEC (72 h): \geq 100 mg/L test mat.

Toxicity to sediment: No hazard was identified

Toxicity to soil macro-organisms : No hazard was identified

Persistence and degradability : No information Available

Bio accumulative potential: The log Kow value of the substance Fumaric acid is 0.46, and thus the substance are not expected to accumulate in organisms.

Mobility in soil : Fumaric acid is readily biodegradable in water and mobility is not expected to be of concern.

Results of PBT and VpVb assessment:

Fumaric acid is readily biodegradable. The log Kow is well below levels of concern. It is not expected to persist or bio accumulate in the environment

Endocrine Disruptive Properties: None

Other Adverse effects: None

13. Disposal Consideration

Disposal method

Product : To be performed as per local regulations.

Contaminated packaging : Can be land filled or incinerated, in compliance with Local Regulations

14. Transport Information

Road transport ADR/RID

Maritime transport IMDG

Air transport ICAO/IATA

} Not Classified as a dangerous goods under transport regulations

· UN proper shipping name

· DOT, ADR/RID/ADN, IMDG, IATA :Not regulated.

· Transport hazard class (es)

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- DOT, ADR/RID/ADN, IMDG, IATA
- Class :Not regulated.

- Packing group
- DOT, ADR/RID/ADN, IMDG, IATA :Not regulated.

- Environmental hazards :Not applicable.

- Special precautions for user :Not applicable.

- Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code :Not applicable

15. Regulatory Information

INTERNATIONAL REGULATIONS

Listed in EC : 297

Brussels Nomenclature : 2917.19

U.S. Food and Drug Administration : 21 CFR 172.350

Safety, health and environmental regulations/legislation specific for the substance or mixture

· United States (USA)

· SARA

· Section 302 (extremely hazardous substances):
Substance is not listed.· Section 313 (Specific toxic chemical listings):
Substance is not listed.· TSCA (Toxic Substances Control Act)
All ingredients are listed or exempt.

· Proposition 65 (California)

· Chemicals known to cause cancer:
Substance is not listed.· Chemicals known to cause developmental toxicity for females:
Substance is not listed.· Chemicals known to cause developmental toxicity for males:
Substance is not listed.· Chemicals known to cause developmental toxicity:
Substance is not listed.

· EPA (Environmental Protection Agency):

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Substance is not listed.

· IARC (International Agency for Research on Cancer):
Substance is not listed.

Canadian Domestic Substances List (DSL):
All ingredients listed on DSL or NDSL.

Responsibility of the receiver to have the knowledge of the local and national regulations.

16. Other Information

References: Prepared in accordance with Material Safety Data Sheet- Guideline-IS 17889-2022,
Current Extended Safety data Sheet for Fumaric Acid

The information provided in this Safety Data Sheet is given in good faith and is correct to the best of our knowledge and information at the date of publication. It is designed only as guidance for safe handling, storage, transportation, use and disposal. No warranty is expressed or implied.

Abbreviations and acronyms:

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road

IMDG: International Maritime Code for Dangerous Goods

DOT: US Department of Transportation

IATA: International Air Transport Association

CAS: Chemical Abstracts Service (division of the American Chemical Society)

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

OSHA: Occupational Safety & Health Administration

vPvB very Persistent, very Bio accumulative

Eye Irrit. 2A: Serious eye damage/eye irritation - Category 2A

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