

**MATERIAL SAFETY DATA SHEET**

Product Name: FUMARIC ACID

Revision Date: 04.09.2007

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**1. Manufacturer and Substance Identification**

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Chemical Name : Fumaric Acid  
Molecular Formula : C<sub>4</sub>H<sub>4</sub>O<sub>4</sub>  
Molecular Weight : 116.07  
Synonyms : Trans-2-butenedioic acid , (E)-Butenedioic acid , 2-butenedioic acid

**2. Composition /Information on ingredients**

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<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

**3. Hazard Identification**

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Hazard Symbol : Xi - Irritant  
R-Phrases : R36  
S-Phrases : S2, S26

**4. First Aid Measures**

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If inhaled : Remove the affected individual to fresh air and medical attention required.

If on skin : Remove contaminated clothing. Wash affected areas thoroughly with soap and water. If irritation develops, seek medical attention.

If in eye : In case of contact with the eyes, rinse immediately for at least 15 minutes with plenty of water. Immediate medical attention required.

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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 : Water, carbon dioxide, dry chemicals, wear self-contained breathing apparatus.
- Hazardous Combustion Products: Toxic fumes of carbon monoxide, carbon dioxide.
- Protection of Firefighters : Should wear proper protective equipment and self-contained breathing apparatus.
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## 6. Accidental Release Measures

- Personal precautions : Avoid Inhalation. Use personal protective equipment. 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.
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## 7. Handling and Storage

### Handling

- General advice : Ensure thorough ventilation of stores and work areas. Take precautionary measures against static discharges. Keep away from sources of ignition - No smoking
- 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 : Protect against moisture. Containers should be stored tightly sealed in a dry place.
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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.
- Hand : Impervious Gloves
- 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

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### 9. Physical and Chemical Properties

Form : Power  
Odour : odorless  
Colour : White  
Melting Point ° C : 287  
Boiling Point ° C : 290 (sublimes)  
Vapor Pressure mm Hg at 25° C :  $1.54 \times 10^{-4}$   
Water Solubility g/l at 25° C : 7  
Density g/cm<sup>3</sup> at 25° C : 1.635

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### 10. Stability and Reactivity

Stability : Stable at normal temperatures.  
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.

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### 11. Toxicological Information

Acute toxicity (lethal doses)  
(Literature value)

LD50/oral/ rat : 9.3 g/kg  
LD50/oral/ rat : 1.0 g/kg  
LD50/dermal/mouse : >20 g/kg

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### 12. Ecological Information

#### Biodegradation:

Toxicity in water : water hazard class 1 (slightly hazardous for water)  
LC50 (zebra fish) : 245 mg/l(48-h)  
EC50 (green algae) : 41 mg/l(72-h)

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### 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

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## 14. Transport Information

Road transport ADR/RID

Maritime transport IMDG  
regulations

Air transport ICAO/IATA

} Not Classified as a dangerous good under transport

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## 15. Regulatory Information

INTERNATIONAL REGULATIONS

Listed in EC : 297

Brussels Nomenclature : 2917.19

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

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

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## 16. Other Information

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.

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