

1. IDENTIFICATION OF THE SUBSTANCE / PREPARATION AND OF THE COMPANY / UNDERTAKING

Product identifier:

Product name: FUMARIC ACID

Synonyms; trade names: Allomaleic acid, Boletic acid, Trans-butenedioic acid, Butenedioic acid, 1,2-ethenedicarboxylic acid

CAS number: 110-17-8

EU index number: 607-146-00-X

EC number: 203-743-0

REACH Registration Number: 01-2119485492-31-XXXX

Relevant identified uses of the substance or mixture and uses advised against:

Identified uses: Chemical resin. Pharmaceuticals.

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2. HAZARDS IDENTIFICATION

Classification of the substance or mixture:

Classification (EC 1272/2008):

Physical hazards: Not Classified

Health hazards: Eye Irrit. 2 - H319

Environmental hazards: Not Classified

Label elements:

EC number: 203-743-0

Pictogram:



Signal word: Warning

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Hazard statements: H319 Causes serious eye irritation.

Precautionary statements: P264 Wash contaminated skin thoroughly after handling.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
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.

Supplementary precautionary statements: P261 Avoid breathing dust.
P271 Use only outdoors or in a well-ventilated area.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P312 Call a POISON CENTER/ doctor if you feel unwell.

Other hazards: This substance is not classified as PBT or vPvB according to current EU criteria.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Substances:

Product name: FUMARIC ACID
EU index number: 607-146-00-X
CAS number: 110-17-8
EC number: 203-743-0
Composition comments: >99.5%

4. FIRST AID MEASURES

Description of first aid measures:

General information: In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). Get medical attention if any discomfort continues.

Inhalation: If breathing stops, provide artificial respiration. When breathing is difficult, properly trained personnel may assist affected person by administering oxygen. Get medical attention if any discomfort continues.

Ingestion: Rinse mouth thoroughly with water. Never give anything by mouth to an unconscious person. Do not induce vomiting. Get medical attention immediately.

Skin contact: Remove contaminated clothing immediately and wash skin with soap and water. Get medical attention if irritation persists after washing.

Eye contact: Remove affected person from source of contamination. Remove any contact lenses and open eyelids wide apart. Continue to rinse for at least 15 minutes. Get medical attention promptly if symptoms occur after washing.

Protection of first aiders: First aid personnel should wear appropriate protective equipment during any rescue.

Most important symptoms and effects, both acute and delayed:

Inhalation: Coughing. Epistaxis (nose bleeding). May cause respiratory system irritation.

Ingestion: May cause discomfort if swallowed.

Skin contact: May cause skin irritation/eczema.

Eye contact: Irritating to eyes. Symptoms following overexposure may include the following: Redness. Pain.

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Indication of any immediate medical attention and special treatment needed:

Notes for the doctor: Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Extinguishing media:

Suitable extinguishing media: Small fires: Extinguish with foam, carbon dioxide or dry powder. Larger fires: Alcohol-resistant foam. Water spray.

Unsuitable extinguishing media: Do not use water jet as an extinguisher, as this will spread the fire.

Special hazards arising from the substance or mixture:

Specific hazards: Dust may form explosive mixture with air.

Hazardous combustion products: Oxides of carbon.

Advice for firefighters:

Protective actions during firefighting: Cool containers exposed to flames with water until well after the fire is out. Control run-off water by containing and keeping it out of sewers and watercourses. Contain and collect extinguishing water.

Special protective equipment for firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and appropriate protective clothing.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures:

Personal precautions: No action shall be taken without appropriate training or involving any personal risk. Keep unnecessary and unprotected personnel away from the spillage. Eliminate all sources of ignition. No smoking, sparks, flames or other sources of ignition near spillage. Provide adequate ventilation. Use suitable respiratory protection if ventilation is inadequate. Wear protective clothing as described in Section 8 of this safety data sheet. Avoid contact with skin and eyes. Avoid inhalation of dust.

Environmental precautions: Do not discharge into drains or watercourses or onto the ground. Spillages or uncontrolled discharges into watercourses must be reported immediately to the Environmental Agency or other appropriate regulatory body.

Methods and material for containment and cleaning up:

Methods for cleaning up: Take precautionary measures against static discharge. Remove spillage with vacuum cleaner or collect with a shovel and broom, or similar. Collect and place in suitable waste disposal containers and seal securely. Containers with collected spillage must be properly labelled with correct contents and hazard symbol.

Reference to other sections: Wear protective clothing as described in Section 8 of this safety data sheet. See Section 11 for additional information on health hazards. Collect and dispose of spillage as indicated in Section 13.

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7. HANDLING AND STORAGE

Precautions for safe handling:

Usage precautions: Wear protective clothing as described in Section 8 of this safety data sheet. Provide adequate general and local exhaust ventilation. If ventilation is inadequate, suitable respiratory protection must be worn. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Take precautionary measures against static discharges. Fill only in dedicated and assigned containers. Nitrogen blanketing required for large scale operations with this compound due to low minimum ignition energy. Avoid generation and spreading of dust. Prevent accumulation of dust.

Advice on general occupational hygiene: Provide eyewash station. Good personal hygiene procedures should be implemented. Wash skin thoroughly after handling. Wash hands thoroughly after handling. Do not eat, drink or smoke when using this product.

Conditions for safe storage, including any incompatibilities:

Storage precautions: Store in tightly-closed, original container in a dry, cool and well-ventilated place. Keep away from heat, sparks and open flame. Take precautionary measures against static discharges. Store away from the following materials: Oxidising materials. Alkalis. Amines. Strong reducing agents. Unsuitable container materials: Zinc. Store at temperatures not exceeding 25°C.

Specific end use(s): The identified uses for this product are detailed in Section 1.2.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters:

Ingredient comments: No exposure limits known for ingredient(s).

DNEL:

- Workers - Inhalation; Long term systemic effects: 175 mg/m³
- Workers - Inhalation; Short term systemic effects: 175 mg/m³
- Workers - Dermal; Long term systemic effects: 50 mg/kg/day
- Workers - Dermal; Short term systemic effects: 50 mg/kg/day
- Consumer - Inhalation; Long term systemic effects: 53 mg/m³
- Consumer - Inhalation; Short term systemic effects: 53 mg/m³
- Consumer - Dermal; Long term systemic effects: 30 mg/kg/day
- Consumer - Dermal; Short term systemic effects: 30 mg/kg/day
- Consumer - Oral; Long term systemic effects: 30 mg/kg/day
- Consumer - Oral; Short term systemic effects: 30 mg/kg/day

PNEC:

- Fresh water; 0.1 mg/l
- Marine water; 0.01 mg/l
- STP; 3 mg/l

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Exposure controls:

Protective equipment:



Appropriate engineering controls: Provide adequate general and local exhaust ventilation. This product must not be handled in a confined space without adequate ventilation.

Eye/face protection: Eyewear complying with an approved standard should be worn if a risk assessment indicates eye contact is possible. Tight-fitting safety glasses.

Hand protection: Chemical-resistant, impervious gloves complying with an approved standard should be worn if a risk assessment indicates skin contact is possible. It is recommended that gloves are made of the following material: Polyvinyl chloride (PVC). Rubber (natural, latex). The most suitable glove should be chosen in consultation with the glove supplier/manufacturer, who can provide information about the breakthrough time of the glove material.

Other skin and body protection: Provide eyewash station. Wear apron or protective clothing in case of contact.

Hygiene measures: When using do not eat, drink or smoke. Wash promptly if skin becomes contaminated. Wash at the end of each work shift and before eating, smoking and using the toilet. Wash contaminated clothing before reuse. Promptly remove any clothing that becomes contaminated.

Respiratory protection: If ventilation is inadequate, suitable respiratory protection must be worn. Wear a full face piece respirator fitted with the following cartridge: Organic vapour filter. Dust and mist filter. High efficiency particulate filter. Particulate filters should comply with European Standard EN143. Wear a full face piece respirator fitted with the following cartridge: Dust, mist and fume filter.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties:

Appearance: Crystalline powder.

Colour: White.

Odour: Odourless.

pH: Not applicable.

Melting point: 287°C

Initial boiling point and range: 290°C @ 570 mm Hg

Flash point: 230°C

Vapour pressure: 1.7 mm Hg @ 165°C

Vapour density: 5.182 kg/m³

Relative density: 1.635 g/cm³ @ 20°C

Solubility(ies): 4.9 g/l water @ 20°C Slightly soluble in water. Soluble in the following materials: Alcohols. Acetone. Ether. Insoluble in the following materials: Chloroform. Benzene. Xylene. Ammonia.

Partition coefficient: log Pow: 0.3

Auto-ignition temperature: 740°C

Viscosity: 4.65 cP @ 105°C

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Other information: None.

Molecular weight: 86.1

10. STABILITY AND REACTIVITY

Reactivity: There are no known reactivity hazards associated with this product.

Chemical stability:

Stability: Stable at normal ambient temperatures and when used as recommended.

Possibility of hazardous reactions: Dust may form explosive mixture with air. Will not polymerise.

Conditions to avoid: Moisture. Avoid heat, flames and other sources of ignition.

Incompatible materials:

Materials to avoid: Strong oxidising agents. Strong reducing agents. Amines. Alkalis.

Hazardous decomposition products: Carbon monoxide (CO). Carbon dioxide (CO₂).

11. TOXICOLOGICAL INFORMATION

Information on toxicological effects:

Other health effects: There is no evidence that the product can cause cancer.

Acute toxicity – oral:

Acute toxicity oral (LD₅₀ mg/kg): 9,300.0

Species: Rat

ATE oral (mg/kg): 9,300.0

Acute toxicity – dermal:

Acute toxicity dermal (LD₅₀ mg/kg): 20,000.0

Species: Rat

Acute toxicity – inhalation:

Acute toxicity inhalation (LC₅₀ dust/mist mg/l): 1.306

Species: Rat

Serious eye damage/irritation: Irritating to eyes.

Skin sensitisation: Guinea pig maximization test (GPMT) - : Not sensitising.

Germ cell mutagenicity:

Genotoxicity - in vivo: Gene mutation: Negative.

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Reproductive toxicity:

Reproductive toxicity – fertility: One-generation study - NOAEL >400 mg/kg/day, Oral, Guinea pig P

Reproductive toxicity – development: Developmental toxicity: - NOAEL: >400 mg/kg/day, Oral, Guinea pig

Specific target organ toxicity - repeated exposure:

STOT - repeated exposure: NOAEL 600 mg/kg, Oral, Rat

Inhalation: May cause respiratory system irritation.

Ingestion: May cause discomfort if swallowed.

Skin contact: May cause skin irritation/eczema.

Eye contact: Irritating to eyes. Symptoms following overexposure may include the following: Redness. Pain.

Target organs: Liver Kidneys

12. ECOLOGICAL INFORMATION

Ecotoxicity: The product is not expected to be hazardous to the environment.

Toxicity:

Acute toxicity – fish: LC₅₀, 96 hours: >100 mg/l, Brachydanio rerio (Zebra Fish)

Acute toxicity – aquatic invertebrates: EC₅₀, 48 hours: 212 mg/l, Daphnia magna

Acute toxicity - aquatic plants: EC₈₀, 72 hours: >100 mg/l, Pseudokirchneriella subcapitata

Acute toxicity – microorganisms: EC₅₀, 3 hours: >300 mg/l, Activated sludge

Acute toxicity – terrestrial: Scientifically unjustified.

Chronic toxicity - fish early life stage: Scientifically unjustified.

Chronic toxicity – aquatic invertebrates: Scientifically unjustified.

Persistence and degradability: The product is readily biodegradable.

Biodegradation: Water - Degradation 67.5%: 28 days

Bioaccumulative potential: No data available on bioaccumulation.

Partition coefficient: log Pow: 0.3

Mobility in soil:

Mobility: No information available.

Results of PBT and vPvB assessment: This product does not contain any substances classified as PBT or vPvB.

Other adverse effects: None known.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods:

General information: Waste is classified as hazardous waste.

Disposal methods: Dispose of waste to licensed waste disposal site in accordance with the requirements of the local Waste Disposal Authority.

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14. TRANSPORT INFORMATION

General: The product is not covered by international regulations on the transport of dangerous goods (IMDG, IATA, ADR/RID).

UN number: Not applicable.

UN proper shipping name: Not applicable.

Transport hazard class(es): No transport warning sign required.

Packing group: Not applicable.

Environmental hazards:

Environmentally hazardous substance/marine pollutant: No.

Special precautions for user: Not applicable.

Transport in bulk according to Annex II of MARPOL and the IBC Code:

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not applicable.

15. REGULATORY INFORMATION

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

National regulations: EH40/2005 Workplace exposure limits.
Health and Safety at Work etc. Act 1974 (as amended).
Control of Substances Hazardous to Health Regulations 2002 (as amended).
Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) (as amended).
Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures (as amended).

EU legislation: Commission Regulation (EU) No 2015/830 of 28 May 2015.
Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) (as amended).
Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures (as amended).

Guidance: Introduction to Local Exhaust Ventilation HS(G)37.
Workplace Exposure Limits EH40.
Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) (as amended).

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Chemical safety assessment: No chemical safety assessment has been carried out.

Note: The regulatory information given above only indicates the principal regulations specifically applicable to the product described in the safety data sheet. The user's attention is drawn to the possible existence of additional provisions which complete these regulations. Refer to all applicable national, international and local regulations or provisions.

16. OTHER INFORMATION

Hazard statements in full: H319 Causes serious eye irritation.

Legal disclaimer: The information contained in this SDS does not constitute a risk assessment, and should not replace the user's own assessment of risks as required by other health and safety legislation. This advice is given by Nexchem Ltd who accept no legal liability for it except otherwise provided by law. The information contained herein is based on the present state of our knowledge and is intended to describe our products from the point of view of safety requirements. It should not therefore be construed as guaranteeing specific properties.