Product Name	Fumaric Acid

Section 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identification:

Product Description: Fumaric Acid

Synonyms: Lichenic acid; trans-Butenedioic acid; Boletic acid

CAS-No: 110-17-8

EC-No.: 203-743-0

Molecular Formula: $C_4H_4O_4$

REACH Registration No: A registration number is not available for this substance as the substance or its use are exempted from registration according to Article 2 REACH Regulation (EC) No 1907/2006, the annual tonnage does not require a registration, or the registration is envisaged for a later registration deadline.

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

Recommended Use: Laboratory chemicals, Manufacturing substance, used as pharma excipients

1.3. Details of the supplier of the safety data sheet:

- **Company** — **Finar Limited**
  184-186/P, Chacharwadi Vasna,
  Sarkhej-Bavla Highway,
  Ta.: Sanand, Dist.: Ahmedabad-382110, Gujarat, India.
  Web: www.finarchemicals.com
- **E-Mail Address** — safety.finar@actylis.com; info.finar@actylis.com

1.4. Emergency Telephone Number:

- For Emergency contact on: +91 - 2717 - 616 717

Product Name	Fumaric Acid

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture:

Labeling according Regulation (EC) No 1272/2008

Eye irritation (Category 2), H319

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2. Label Elements:

Labeling according Regulation (EC) No 1272/2008

Pictogram

Signal word: Warning

Hazard statement(s)

H319 Causes serious eye irritation.

Precautionary statement(s)

Prevention

P264 Wash thoroughly after handling.

P280 Eye protection / face protection.

Response

P305+P351+P338 IF IN EYES: Rinse continuously 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.

Supplemental Hazard Statements: None

2.3. Other Hazards:

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances: Fumaric acid

3.2. Mixtures:

Component	CAS-No	EC-No.	Weight %
Fumaric acid	110-17-8	203-743-0	> 95

SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures:

- **General advice**
  Consult a physician. Show this safety data sheet to the doctor in attendance.
- **If inhaled**
  Remove from exposure, lie down. Move to fresh air. If not breathing, give artificial respiration. Obtain medical attention.
- **If Contact with skin**
  Wash off immediately with plenty of water for at least 15 minutes. Obtain medical attention.
- **In case of eye contact**
  Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.
- **If swallowed**
  Do not induce vomiting. Clean mouth with water. Get medical attention.

4.2. Most important symptoms and effects, both acute and delayed:

Nausea

irritant effects

4.3. Indication of any immediate medical attention and special treatment needed:

No Data Available

SECTION 5: FIREFIGHTING MEASURES

5.1. Extinguishing media:

Suitable Extinguishing Media- Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Unsuitable Extinguishing Media- For this substance/mixture no limitations of extinguishing agents are given.

5.2. Special hazards arising from the substance or mixture:

Combustible.

Carbon oxides

Risk of dust explosion.

Vapours are heavier than air and may spread along floors.

Forms explosive mixtures with air on intense heating.

Development of hazardous combustion gases or vapours possible in the event of fire.

5.3. Advice for firefighters:

Special protective equipment for firefighters

In the event of fire, wear self-contained breathing apparatus.

5.4 Further Information:

Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures:

Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Avoid breathing dust.

For personal protection see section 8.

6.2. Environmental precautions:

Do not let product enter drains.

6.3. Methods and material for containment and cleaning up:

Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4. Reference to other sections:

For disposal see Sections 13.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling:

Avoid contact with skin and eyes. Avoid breathing dust. Do not ingest. Minimize dust generation and accumulation. Wash hands before breaks and immediately after handling the product.

7.2. Conditions for safe storage, including any incompatibilities:

Keep in a dry, cool and well-ventilated place. Keep container tightly closed.

7.3. Specific end use(s):

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters:

Contains no substances with occupational exposure limit values.

8.2. Exposure Controls:

Appropriate Engineering Controls:

Technical measures and appropriate working operations should be given priority over the use of personal protective equipment. See section 7.1.

Personal Protective Equipment:

Protective clothing needs to be selected specifically for the workplace, depending on concentrations and quantities of the hazardous substances handled. The chemical resistance of the protective equipment

should be enquired at the respective supplier.

Eye & Face Protection-

Safety glasses

Skin & Body Protection-

Wear appropriate protective gloves and clothing to prevent skin exposure

Respiratory Protection-

Required when dusts are generated.

Recommended Filter type: Filter P 2 (acc. to DIN 3181) for solid and liquid particles of harmful substances.

Environmental Exposure Controls-

Do not let product enter drains.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties:

- **Appearance:** White
- **Physical State:** Solid
- **Odor:** Odorless
- **Odor Threshold:** No data available
- **pH:** 2.1 at 4.9 g/l at 20 °C
- **Melting Point:** 295 °C - 300 °C
- **Critical Temperature:** No data available
- **Vapor Pressure:** 2.2 hPa at 165 °C
- **Relative Density:** 1.634 – 1.636 g/cm3 at 20 °C
- **Density:** No data available
- **Ignition Temperature:** 375 °C
- **Decomposition Temperature:** > 350 °C
- **Volatility:** No data available
- **Bulk Density:** No data available
- **Viscosity, dynamic:** No data available
- **Viscosity, Kinematic:** No data available
- **Water/Oil Dist. Co eff.:** No data available
- **Partition Co-efficient: n-octanol/Water:** log Pow: 0.45 – 0.47 at 20 °C
- **Ionicity (in Water):** No data available
- **Lower Explosion Limit:** 3 %(V)

- **Upper Explosion Limit:** 40 %(V)
- **Boiling Point/Range:** No data available
- **Specific Gravity:** 1.620
- **Flash Point:** 272 °C – 274 °C
- **Water Solubility:** No data available

9.2. Other information:

Molecular Formula: $C_4H_4O_4$

Molecular Weight: 116.07 g/mol

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity:

Risk of dust explosion.

Forms explosive mixtures with air on intense heating.

A range from approx. 15 Kelvin below the flash point is to be rated as critical.

The following applies in general to flammable organic substances and mixtures: in correspondingly fine distribution, when whirled up a dust explosion potential may generally be assumed.

10.2. Chemical stability:

Stable under normal conditions.

10.3. Possibility of hazardous reactions:

Violent reactions possible with: Oxidizing agents, Bases, Reducing agents, Amines

10.4. Conditions to avoid:

Incompatible products. Strong heating.

10.5. Incompatible materials:

Strong oxidizing agents, Amines, Strong bases

10.6. Hazardous decomposition products:

Hazardous decomposition products formed under fire conditions. - Carbon monoxide (CO), Carbon dioxide (CO2)

Other decomposition products - No data available

In the event of fire: see section 5

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute Oral toxicity

LD50 Oral - Rat - female - 9.300 mg/kg

(OECD Test Guideline 401)

Acute inhalation toxicity

LC50 Inhalation - Rat - male and female - 4 h - > 1.306 mg/l

(OECD Test Guideline 403)

Remarks: (ECHA)

Acute dermal toxicity

LD50 Dermal - Rabbit - female - 20.000 mg/kg

(OECD Test Guideline 402)

Remarks: (IUCLID)

Skin irritation

Skin - Rabbit

Result: No skin irritation - 4 h

(OECD Test Guideline 404)

Eye irritation

Eyes - Rabbit

Result: Causes serious eye irritation.

(OECD Test Guideline 405)

Sensitisation

Maximisation Test - Guinea pig

Result: negative

(OECD Test Guideline 406)

Germ cell mutagenicity

In vitro mammalian cell gene mutation test

mouse lymphoma cells

Result: negative

Mutagenicity (mammal cell test): chromosome aberration.

Chinese hamster lung cells

Result: negative

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

Reproductive toxicity

No data available

Teratogenicity

No data available

Specific target organ toxicity - single exposure

No data available

Acute oral toxicity - After uptake of large quantities: Irritation of mucous membranes, Nausea

Acute inhalation toxicity - Possible damages: Irritation symptoms in the respiratory tract.

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

11.2 Further Information:

Repeated dose toxicity - Rat - male - Oral - 2 yr - No observed adverse effect level - 600 mg/kg

RTECS: LS9625000.

Gastrointestinal disturbance

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Other dangerous properties cannot be excluded.

Handle in accordance with good industrial hygiene and safety practice.

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity:

Toxicity to fish

Semi-static test LC50 - Danio rerio (zebra fish) - > 100 mg/l - 96 h

(OECD Test Guideline 203)

Toxicity to daphnia and other aquatic invertebrates

Semi-static test EC50 - Daphnia magna (Water flea) - > 100 mg/l -48 h

(OECD Test Guideline 202)

Toxicity to algae

Static test EC50 - Pseudokirchneriella subcapitata - > 100 mg/l - 72h

(OECD Test Guideline 201)

Static test NOEC - Pseudokirchneriella subcapitata (green algae) - 100 mg/l - 72 h

(OECD Test Guideline 201)

Toxicity to bacteria

Static test EC50 - activated sludge - > 300 mg/l - 3 h

(OECD Test Guideline 209)

12.2 Persistence and degradability:

Biodegradability aerobic - Exposure time 28 d

Result: ca.67.5 % - Readily biodegradable.
(OECD Test Guideline 301B)

Theoretical oxygen Demand 827 mg/g
Remarks: (Lit.)

Ratio BOD/ThBOD 34 %
Remarks: (Lit.)

12.3 Bioaccumulate potential:

Partition coefficient: n-octanol/waterlog
Pow: 0.33
(experimental)
Bioaccumulation is not expected. (Lit.)

12.4 Mobility in soil:

No data available

12.5 Results of PBT and vPvB assessment

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6 Other adverse effects:

Henry constant
Transition from water solution into the atmosphere is not to be expected.
Discharge into the environment must be avoided.

SECTION 13: Disposal considerations

13.1 Waste treatment methods:

Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself.

SECTION 14: Transport information

	Land transport (ADR/RID)	Air transport (IATA)	Sea transport (IMDG)
14.1 UN number	Not classified as dangerous in the meaning of transport regulations.		
14.2 Proper shipping name	Not classified as dangerous in the meaning of transport regulations.		
14.3 Class	Not classified as dangerous in the meaning of transport regulations.		
14.4 Packing group	Not classified as dangerous in the meaning of transport regulations.		
14.5 Environmentally hazardous	Not classified as dangerous in the meaning of transport regulations.		
14.6 Special precautions for user	Not classified as dangerous in the meaning of transport		

	regulations.

SECTION 15: Regulatory information

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

National legislation

Storage class 10 - 13

15.2 Chemical safety assessment:

For this product a chemical safety assessment was not carried out.

SECTION 16: Other information

Full text of H-Statements referred to under sections 2 and 3.

H319 Causes serious eye irritation.

Training advice:

Provide adequate information, instruction and training for operators.

Labeling:

Pictogram

Signal word: **Warning**

References: Not available

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