

 YONGSAN CHEMICALS	<h1>Material Safety Data Sheet</h1>	Issuing Date	1996. 6.28
		Page	1/6
		Rev. No.	6
		Rev. Date	2018. 3. 2.

FUMARIC ACID

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

a. Product name	FUMARIC ACID
b. Recommend use of the chemical	Unsaturated Polyester resin, Alkyd Resin, Feed Additives
c. Restriction on use	No data available
d. Manufacture Information	
Factory	Yongsan Chemical, Inc. 636, Bugog-dong, Nam-gu, Ulsan, Korea 052 - 226 - 8861 / 5 Safety Environment Team
HEAD OFFICE	02-3274-9171

2. HAZARD IDENTIFICATION

a. Hazard-Risk Classification Irritating to the eyes : Category 2

b. Label elements including precautionary statements

Symbol



Signal word

Warning

Hazard statement

H319 Cause serious eye irritation

Precaution statement

Precaution

P264 Wash hand thoroughly after handling

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

Response

P337+P313 If eye irritation persists; Get medical advice/attention

P305+P351+P338 If in eyes; Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continuous rinsing

Storage

-

Disposal

-

c. Othe Hazard-Risk which are not included in the classification criteria (NFPA)

Heath 2

Fire 1

Reactivity 0

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	Other name	CAS Number	EN Number	Content (%)
Fumaric acid	Trans-butendioic acid	110-17-8	203-743-0	99.5 (Min)
Other	-	-	-	0.5 (Max)

Yongsan Chemical, INC.



Material Safety Data Sheet

Issuing Date	1996. 6.28
Page	2/6
Rev. No.	6
Rev. Date	2018. 3. 2.

4. FIRST AID MEASURE

- a. Inhalation
 - Move from exposure immediately if adverse effect.
 - If breathing has stopped, apply artificial respiration.
 - Get medical attention.
- b. Skin contact
 - Remove contaminated clothings and shoes. Immediately wash with soap and water for at least 15 minutes.
 - Get medical attention if needed.
 - Wash contaminated clothing and shoes before reuse
- c. Ingestion
 - Obtain medical attention if ingested much.
 - Rinse mouth with large amounts of water.
- d. Eye contact
 - Wash exposed eye with large amount of water for at 15 minutes.
 - Get immediate medical advice/attention.

5. FIRE-FIGHTING METHOD

- a. Extinguish media
 - Regular dry chemical, Carbon dioxide, Water, Regular foam
- b. Specific hazards arising from the chemical
 - Pyrosis product
 - rritating vapor (Oxides of carbon, maleic anhydride)
 - Fire and explosion hazards
 - Slight fire hazrd. Dust/air mixture may ignite or explode
- c. Specific protective equipment and precaution for fire-fighter
 - Wear appropriate chemical resistance equipment.
 - Move container from fire area if it can be done without risk
 - Do not scatter spilled material with high pressure water streams
 - Dike for later disposal

6. Accidental release measure

- a. Personal precaution, protective equipment and emergency procedures
 - Wear appropriate personel protective equipment.
 - Do not raise dust. Do not inhale raising dust.
 - Remove contaminated clothing and shoes.
 - Use adequate ventilation.
- b. Enviornment precaution and protective procedure
 - Cover with plastic sheet or trap to minimize spreading and protect from contact with water
 - Dike for not flowing down the drain, underground water and surface water spills.
 - Absorb with activate carbon
- c. Methods and material for containment and cleaning up
 - Small spills
 - Absorb with sand or non-combustible material. Collect spilled material in appropriate container for disposal.
 - Neutrize to add an alkaline material.
 - large spills
 - Collect spilled material in appropriate container for disposal
 - Keep unnecessary people away, isolate hazard area

7. HANDLING AND STORAGE

- Storage
 - Store and handle in accordance with all current regulation and standards.
 - Store in a sealed container. Keep container in a well-ventilated place
 - Keep separated from incompatible substance. Store in a cool/low temperature, dry place.
- Handling
 - Completely wipe out. Use adequate ventillation. Minimize generation and accumulation of dust.



Material Safety Data Sheet

Issuing Date	1996. 6.28
Page	3/6
Rev. No.	6
Rev. Date	2018. 3. 2.

Avoid contact with eye, skin and clothing. Store in a tightly closed container. Avoid contact with ingestion and inhalation.

8. Exposure controls and personal protection.

- a. Control parameter FUMARIC ACID
No occupational exposure limits established
- b. Ventillation Provide local exhaust ventillation system.
Ventillationequipment should be expasion-resistant if explosive concentrations of material are present.
Ensure compliance with applicable exposure limits
- c. Eye protection Wear splash resisitant safety goggles.
Provide an emergency eye wash fountain and quick drench shower in the immediate work area.
- d. Body protection Wear appropriate chemical resistance clothing.
- e. Hand protection Wear appropriate chemical resistance gloves.
- f. Respiratory protection Under conditions of frequent use or heavy exposure.
Respiratory protection is ranked in order from minimum to maximum. Consider warning properties before use.
Any chemical cartridge respirator with organic vapor cartridge and dust and mist filter
Any chemical cartridge respirator with organic vapor cartridge and high-efficiency particular filter.
Any air-purifying respirator with a full facepiece, an organic vapor canister and a dust, mist, and fume filter.

9. PHYSICAL AND CHEMICAL PROPERTIES

- a. Appearance White crystal powder
- b. Color White
- c. Odor odorless
- d. Odor threshold No data available
- e. pH Not appicable
- f. Melting point/freezing point 287 °C (sealed tube)
- g. Initial boiling point 290 °C (554 °F) 760 hPa (570 mmHg) - DIN 53171
- h. Flash point 230 °C (446 °F), Sealed tube - DIN 51755 Part 1
- i. Upper/lower flammability or explosive limits 106-1,413g/m³
- j. Evaporation rate Not appicable
- k. Flammability(solid, gas) Not appicable
- l. Vapor pressure 2.2 hPa (1.7 mmHg) @165 °C
- m. Vapor density(air=1) 5.182 kg/m³
- n. Relative density(water=1) 1.635 g/c m³ @20 °C
- o. Solubility 4,900 mg/L at 20 °C
- p. Auto ignition temperature 740 °C
- q. Viscosity 4.65 CP/105 °C
- r. Partition coefficient log Pow: 0.3
- s. Solvent solubility
Solubility Alcohol, Aceti\one, Ether
Insolubility Olive oil, Chloroform, CCl₄, Benzene, Xylene, Ammonia aqueous solution

10. STABILITY AND REACTIVITY

- a. Chemical stability Stable at normal temperature and pressure.



Material Safety Data Sheet

Issuing Date	1996. 6.28
Page	4/6
Rev. No.	6
Rev. Date	2018. 3. 2.

- b. Condition to avoid Avoid heat, flames, sparks and other sources of ignition. Avoid contact with incompatible material.
- c. Incompatible material Amine, Base, Oxidant, Strong reductant
- d. Hazardous decomposition Oxides of carbon
- e. Polymerization Will not available polymerize

11. TOXICOLOGICAL INFORMATION

a. Information on the likely routes of exposure;

- Inhalation Harmful if inhaled. Irritating airway.
- Ingestion Harmful if ingested.
- Skin contact May cause irritaion
- Eye Contact May cause irritaion

b. Health Hazard

- Acute oral toxic 9,300 mg/Kg - Rat - LD50
- Acute dermal toxic 20,000 mg/Kg - Rabbit - LD50
- Acute inhalation toxic No data available
- Skin corrosive/irritant 500mg/24 hr skin - rabbit slightly irritating
- Serious eye damage/eye irritation 100mg/24 hr eye - rabbit moderately irritating
- Specific target organ toxicity No data available
(single exposure)
- Specific target organ toxicity No data available
(repeat exposure)
- Genetic toxicity No data available
- Toxicity to reproduction Not applicable
- Carcinogenicity
- IARC Not applicable
- ACGIH Not applicable
- NTP, OSHA, WISHA Not applicable

12. ECOLOGICAL INFORMATION

a. Aquatic and terrestrial ecotoxicity

- Fish EC50 - 245 mg/l 48 hr (Brachydanio rerio) Method DIN 38412
- Crustacea EC50 - 73.6 mg /l 24 hr Daphnia magna(Crustacea) Method DIN 38412
- Aquatic plant EC50 - 41 mg/L 72 hr Algae

b. Persistence and degradability

- Persistence No data available
- degradability No data available

c. Bioaccumulative potential

- Bioaccumulative No data available
- Biodegradation 98% (21days)

d. Mobility in soil No data available

e. Other adverse effect No data available



Material Safety Data Sheet

Issuing Date	1996. 6.28
Page	5/6
Rev. No.	6
Rev. Date	2018. 3. 2.

13. DISPOSAL CONSIDERATION

- a. Disposal method Disposal in accordance with all applicable regulation. Disposal of wastes in an approved waste disposal facility
- b. Disposal precaution Consideration to precaution all applicable regulation.

14. TRANSPORT INFORMATION

- a. UN Number No classification assigned
- b. UN proper shipping name No classification assigned
- c. Transport hazard class No classification assigned
- d. Packing group(if applicable) No classification assigned
- e. Marine pollution No
- f. Specific precaution No

15. Regulatory information

a. Korea regulations

- Industrial Safety and Health Act Not applicable
- Chemical control Act Not applicable
- Dangerous Material Safety Control Act Not applicable
- Wastes Management Act Not applicable

b. U.S regulation

- CERCLA 103 (40 CFR 302.4) : Y
- FUMARIC ACID : 5000 LBS RQ
- SARA 313 (40 CFR372.65) : N
- SARA 302 (40 CFR 355.30) : N
- SARA 304 (40 CFR 355.40) : N
- SARA hazard category, SARA 311/312 (40 CFR 370.21)

Acute : Yes

Chronic : No

Fire : No

Reactive : No

Sudden release : No

OSHA regulation (29 CFR 1910.119) : Not applicable

TSCA Listed

State Regulation California proposition 65 : N

EU Regulation R 36 Irritating to eyes
 S 2 Keep out of the reach of children
 S 26 In case of contact with eyes rinse immediately with plenty of water and seek medical advice.

INVENTORY STATUS	Canada	DSL	LISTED
	Australia	AICS	LISTED
	Philiphine	PICCS	LISTED
	China	IECSC	LISTED
	Japan	ENCS	LISTED

 YONGSAN CHEMICALS	<h1>Material Safety Data Sheet</h1>	Issuing Date	1996. 6.28
		Page	6/6
		Rev. No.	6
		Rev. Date	2018. 3. 2.

New zealand	NZIoC	LISTED
Korea	ECL	LISTED

16. Other information

a. Information source and reference

Croner´s: Emergency Spillage Guide.
 Croner´s: Emergency First Aid Guide. Croner´s: Substances Hazardous to Health. ERG 2004, , RSAP, US DOT
 National Institute of Technology and Evaluation, Japan
 UN Recommendations on the Transport of Dangerous Goods Model Regulations, 14th Edition
 TOXNET, U.S. National Library of Medicine <http://toxnet.nlm.nih.gov>
 The Chemical Database, The Department of Chemistry at the University of Akron
<http://ull.chemistry.uakron.edu/erd>
 International Chemical Safety Cards(ICSC) <http://www.nihs.go.jp/ICSC>
 ECB-ESIS(European chemical Substances Information System) <http://ecb.jrc.it/esis>
 ECOTOX Database, EPA <http://cfpub.epa.gov/ecotox>
 IUCLID Chemical Data Sheet, EC-ECB
 Initial Assessment Report for SIAM 19, Synthetic Amorphous Silica, July 2004, UNEP, OECD.
 IMDG Code 2006 edition (Amendment 33-06), IMO

b. Issuing date

28. June. 1996.

c. Revision number and date

Revision 6 / 2018. 3. 2.

d. Others

-