

SAFETY DATA SHEET

Version 8.0
Revision Date 16.04.2020
Print Date 08.06.2020**SECTION 1: Identification of the substance/mixture and of the company/undertaking****1.1 Product identifiers**

Product name : Maleic acid

Product Number : M153
Brand : Aldrich
Index-No. : 607-095-00-3
CAS-No. : 110-16-7

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

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : SIGMA-ALDRICH CANADA CO.
2149 WINSTON PARK DRIVE
OAKVILLE ON L6H 6J8
CANADA

Telephone : +1 905 829-9500
Fax : +1 905 829-9292

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

SECTION 2: Hazards identification**2.1 Classification of the substance or mixture****GHS Classification in accordance with Hazardous Products Regulations (HPR) (SOR/2015-17)**

Acute toxicity, Oral (Category 4), H302
Acute toxicity, Dermal (Category 4), H312
Skin corrosion (Category 1B), H314
Serious eye damage (Category 1), H318
Skin sensitisation (Category 1), H317
Specific target organ toxicity - single exposure (Category 3), Respiratory system, H335
Short-term (acute) aquatic hazard (Category 3), H402

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

2.2 GHS Label elements, including precautionary statements

Pictogram



| | |
|----------------------------|---|
| Signal word | Danger |
| Hazard statement(s) | |
| H302 + H312 | Harmful if swallowed or in contact with skin. |
| H314 | Causes severe skin burns and eye damage. |
| H317 | May cause an allergic skin reaction. |
| H335 | May cause respiratory irritation. |
| H402 | Harmful to aquatic life. |
| Precautionary statement(s) | |
| P260 | Do not breathe dust or mist. |
| P264 | Wash skin thoroughly after handling. |
| P270 | Do not eat, drink or smoke when using this product. |
| P271 | Use only outdoors or in a well-ventilated area. |
| P272 | Contaminated work clothing should not be allowed out of the workplace. |
| P273 | Avoid release to the environment. |
| P280 | Wear protective gloves/ protective clothing/ eye protection/ face protection. |
| P301 + P312 + P330 | IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth. |
| P301 + P330 + P331 | IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. |
| P303 + P361 + P353 | IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water. |
| P304 + P340 + P310 | IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor. |
| P305 + P351 + P338 + P310 | IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor. |
| P333 + P313 | If skin irritation or rash occurs: Get medical advice/ attention. |
| P362 + P364 | Take off contaminated clothing and wash it before reuse. |
| P403 + P233 | Store in a well-ventilated place. Keep container tightly closed. |
| P405 | Store locked up. |
| P501 | Dispose of contents/ container to an approved waste disposal plant. |

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

SECTION 3: Composition/information on ingredients

3.1 Substances

| | | |
|------------------|---|--|
| Synonyms | : | Toxilic acid cis-Butenedioic acid |
| Formula | : | C ₄ H ₄ O ₄ |
| Molecular weight | : | 116.07 g/mol |
| CAS-No. | : | 110-16-7 |
| EC-No. | : | 203-742-5 |
| Index-No. | : | 607-095-00-3 |

| Component | Classification | Concentration * |
|-------------------------------|--------------------------|--------------------|
| (Z)-2-Butenedioic acid | Acute Tox. 4; Skin Corr. | <= 100 % |

| | | |
|------------------|--|--|
| | 1B; Eye Dam. 1; Skin Sens. 1; STOT SE 3; Aquatic Acute 3; H302, H312, H314, H318, H317, H335, H402 | |
| * Weight percent | | |

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

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. Move out of dangerous area.

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact

Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water. Consult a physician.

In case of eye contact

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician. Continue rinsing eyes during transport to hospital.

If swallowed

Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

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.

5.2 Special hazards arising from the substance or mixture

Carbon oxides

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information

No data available

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. Evacuate personnel to safe areas. Avoid breathing dust.

For personal protection see section 8.

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials 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 section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Provide appropriate exhaust ventilation at places where dust is formed.

For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

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

Storage class (TRGS 510): 8A: Combustible, corrosive hazardous materials

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

8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact

Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested: Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested: Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374

If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection

Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

- | | |
|--|--|
| a) Appearance | Form: powder, finecrystalline Colour: white |
| b) Odour | slightly sourish |
| c) Odour Threshold | No data available |
| d) pH | 1.3 at 100 g/l at 20 °C (68 °F) |
| e) Melting point/freezing point | Melting point: 130 - 135 °C (266 - 275 °F) |
| f) Initial boiling point and boiling range | 157.8 °C 316.0 °F at 997 hPa - OECD Test Guideline 103 |
| g) Flash point | No data available |
| h) Evaporation rate | No data available |
| i) Flammability (solid, gas) | No data available |

| | |
|---|---|
| j) Upper/lower flammability or explosive limits | No data available |
| k) Vapour pressure | < 0.1 hPa at 20 °C (68 °F) - OECD Test Guideline 104 |
| l) Vapour density | 4.0 at 20 °C(68 °F) |
| m) Relative density | 1.59 g/cm ³ at 25 °C (77 °F) - lit. |
| n) Water solubility | 478.8 g/l at 20 °C (68 °F) - OECD Test Guideline 105 - completely soluble |
| o) Partition coefficient: n-octanol/water | log Pow: -1.3 at 20 °C (68 °F) - OECD Test Guideline 107 - Bioaccumulation is not expected. |
| p) Auto-ignition temperature | No data available |
| q) Decomposition temperature | > 135 °C (> 275 °F) - |
| r) Viscosity | No data available |
| s) Explosive properties | No data available |
| t) Oxidizing properties | No data available |

9.2 Other safety information

| | |
|-------------------------|-----------------------------|
| Minimum ignition energy | > 30 - < 100 mJ |
| Bulk density | 750 - 800 kg/m ³ |
| Relative vapour density | 4.0 at 20 °C (68 °F) |

SECTION 10: Stability and reactivity

10.1 Reactivity

No data available

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

No data available

10.4 Conditions to avoid

No data available

10.5 Incompatible materials

Strong oxidizing agents

10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Carbon oxides

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 toxicity

No data available

LD50 Oral - Rat - male and female - 1,090 mg/kg
(OECD Test Guideline 401)

Remarks: (in analogy to similar compounds)

Inhalation: No data available

Inhalation: No data available

Inhalation: Irritating to respiratory system.

Dermal: No data available

Dermal: No data available

No data available

No data available

Skin corrosion/irritation

No data available

Skin - In vitro study

Result: Causes burns.

(OECD Test Guideline 435)

Serious eye damage/eye irritation

No data available

Causes serious eye damage. (Regulation (EC) No 1272/2008, Annex VI)

Respiratory or skin sensitisation

No data available

Maximisation Test - Guinea pig

Result: positive

(OECD Test Guideline 406)

Local lymph node assay (LLNA) - Mouse

Result: positive

(OECD Test Guideline 429)

(Regulation (EC) No 1272/2008, Annex VI)

Germ cell mutagenicity

No data available

No data available

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.

ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

Reproductive toxicity

No data available

No data available

Specific target organ toxicity - single exposure

No data available

Acute oral toxicity - Vomiting, Irritations of mucous membranes in the mouth, pharynx, oesophagus and gastrointestinal tract.

Acute inhalation toxicity - mucosal irritations, Cough, Shortness of breath, Possible damages:, damage of respiratory tract, Lung oedema, Symptoms may be delayed.

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Additional Information

RTECS: Not available

Gastrointestinal disturbance

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

Systemic effects:

After absorption:

Allergic reactions, Cough, Irritations, Shortness of breath, Vomiting, Lung oedema

Possible effects:

Damage to:, respiratory tract

Other dangerous properties can not be excluded.

Handle in accordance with good industrial hygiene and safety practice.

SECTION 12: Ecological information

12.1 Toxicity

No data available

Toxicity to daphnia and other aquatic invertebrates static test EC50 - Daphnia magna (Water flea) - 42.81 mg/l - 48 h (OECD Test Guideline 202)

Toxicity to algae static test ErC50 - Pseudokirchneriella subcapitata (green algae) - 74.35 mg/l - 72 h (OECD Test Guideline 201)

Toxicity to bacteria static test EC10 - Pseudomonas putida - 44.6 mg/l - 18 h (DIN 38 412 Part 8)
Remarks: (in analogy to similar products)

12.2 Persistence and degradability

No data available

Theoretical oxygen demand 830 mg/g
Remarks: (Lit.)

Ratio BOD/ThBOD 77 %
Remarks: (Lit.)

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Harmful to aquatic life.

Discharge into the environment must be avoided.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Contact a licensed professional waste disposal service to dispose of this material. Offer surplus and non-recyclable solutions to a licensed disposal company.

Contaminated packaging

Dispose of as unused product.

SECTION 14: Transport information

DOT (US)

UN number: 3261 Class: 8 Packing group: II
Proper shipping name: Corrosive solid, acidic, organic, n.o.s. ((Z)-2-Butenedioic acid)
Reportable Quantity (RQ): 5000 lbs
Poison Inhalation Hazard: No

IMDG

UN number: 3261 Class: 8 Packing group: II EMS-No: F-A, S-B
Proper shipping name: CORROSIVE SOLID, ACIDIC, ORGANIC, N.O.S. ((Z)-2-Butenedioic acid)

IATA

UN number: 3261 Class: 8 Packing group: II
Proper shipping name: Corrosive solid, acidic, organic, n.o.s. ((Z)-2-Butenedioic acid)

SECTION 15: Regulatory information

This product has been classified in accordance with the hazard criteria of the Hazardous Products Regulations (HPR) and the SDS contains all the information required by the HPR.

SECTION 16: Other information

Further information

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