

SAFETY DATA SHEET

Version 6.3
Revision Date 2022.04.22
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Date of first issue 2019.10.23
Product Number Sigma-Aldrich - 63200

SECTION 1: Identification of the substance/mixture and of the company/undertaking

- a. Product name : Maleic anhydride
- Product Number : 63200
- b. Brand : Sigma-Aldrich
- Recommended use of the chemical and restrictions on use : **Identified uses**
Laboratory chemicals, For research use only.
- c. Company : 씨그마알드리치코리아(유)
서울특별시 강남구 테헤란로 508,
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월요일 - 금요일 (공휴일 제외)

SECTION 2: Hazards identification**a. GHS Classification**

Acute toxicity, Oral (Category 4)
Skin corrosion/irritation (Category 1)
Serious eye damage/eye irritation (Category 1)
Respiratory sensitization (Category 1)
Skin sensitization (Category 1)
Specific target organ toxicity - repeated exposure, Inhalation (Category 1), Respiratory system

b. GHS-Labeling

Pictogram



Signal Word

Danger

Hazard statement(s)	
H302	Harmful if swallowed.
H314	Causes severe skin burns and eye damage.
H317	May cause an allergic skin reaction.
H318	Causes serious eye damage.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H372	Causes damage to organs (Respiratory system) through prolonged or repeated exposure if inhaled.
Precautionary statement(s)	
Prevention	
P260	Do not breathe dust/ fume/ gas/ mist/ vapors/ spray.
P264	Wash the contact area thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P272	Contaminated work clothing should not be allowed out of the workplace.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P284	Wear respiratory protection.
Response	
P301 + P312 + P330	IF SWALLOWED: Call a POISON CENTER or doctor/ physician 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/ shower.
P304 + P340 + P310	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor/ physician.
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 or doctor/ physician.
P333 + P313	If skin irritation or rash occurs: Get medical advice/ attention.
P342 + P311	If experiencing respiratory symptoms: Call a POISON CENTER/ doctor.
P362 + P364	Take off contaminated clothing and wash it before reuse.
Storage	
P405	Store locked up.
Disposal	
P501	Dispose of contents and container according to wastes control act.

c. Other hazards which do not result in classification

Corrosive to the respiratory tract.
Corrosive to the respiratory tract.
Sternutator.

SECTION 3: Composition/information on ingredients

3a Substances

Synonyms : 2,5-Furandione

Formula : C₄H₂O₃
Molecular weight : 98.06 g/mol
CAS-No. : 108-31-6
EC-No. : 203-571-6
Index-No. : 607-096-00-9

Component		Classification	Concentration
maleic anhydride			
CAS-No.	108-31-6	Acute Tox. 4; 1; Resp.	>=95 - <= 100 %
EC-No.	203-571-6	Sens. 1; Skin Sens. 1;	
Index-No.	607-096-00-9	STOT RE 1; H302, H314, H318, H334, H317, H372	

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

SECTION 4: First aid measures

a. In case of eye contact

After eye contact: rinse out with plenty of water. Immediately call in ophthalmologist. Remove contact lenses.

b. In case of skin contact

In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower. Call a physician immediately.

c. If inhaled

After inhalation: fresh air. Call in physician.

d. If swallowed

After swallowing: make victim drink water (two glasses at most), avoid vomiting (risk of perforation). Call a physician immediately. Do not attempt to neutralise.

e. Most important acute symptoms/effects

No data available

Most important delayed symptoms/effects

No data available

f. Notes to physician

No data available

General advice

First aiders need to protect themselves. Show this material safety data sheet to the doctor in attendance.

SECTION 5: Firefighting measures

a. Suitable extinguishing media

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

b. Specific hazards arising from the chemical

Combustible. Vapors 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.

c. Special protective actions for fire-fighters

Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

Further information

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

SECTION 6: Accidental release measures**a. Personal precautions, protective equipment and emergency procedures**

Advice for non-emergency personnel: Avoid generation and inhalation of dusts in all circumstances. Avoid substance contact. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert.

b. Environmental precautions

Do not let product enter drains.

c. Methods and materials for containment and cleaning up

Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up carefully. Dispose of properly. Clean up affected area. Avoid generation of dusts.

SECTION 7: Handling and storage**a. Precautions for safe handling**

Work under hood. Do not inhale substance/mixture.

b. Conditions for safe storage

Tightly closed. Dry. Keep in a well-ventilated place. Keep locked up or in an area accessible only to qualified or authorized persons.
Moisture sensitive.

c. Storage class

Storage class (TRGS 510): 6.1D: Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

SECTION 8: Exposure controls/personal protection**a. Control parameters****b. Appropriate engineering controls**

No data available

c. Personal protective equipment**Respiratory protection**

required when dusts are generated. Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

Hand 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.

The selected protective gloves have to satisfy the specifications of Regulation (EU) 2016/425 and the standard EN 374 derived from it.

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 EC 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.

Eye protection

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

Skin and body protection

protective clothing

Hygiene measures

Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.

SECTION 9: Physical and chemical properties

a. Appearance

Form solid

Color white

b. Odor No data available

c. Odor Threshold No data available

d. pH No data available

e. Melting point 52 - 54 °C
51 - 56 °C - lit.

f. Initial boiling point 200 °C - lit.

g. Flash point 103 °C - c.c.

h. Evaporation rate No data available

i. Flammability (solid, gas)	No data available
j. Lower explosion limit	1.4 %(V)
Upper explosion limit	7.1 %(V)
k. Vapor pressure	No data available
l. Water solubility	407 g/l at 20 °C - OECD Test Guideline 105
m. Relative vapor density	No data available
n. Density	1.48 g/cm ³ at 20 °C
o. Partition coefficient: n- octanol/water	log Pow: -2.61 at 20 °C - Bioaccumulation is not expected.
p. Autoignition temperature	475 °C
q. Decomposition temperature	No data available
r. Viscosity, dynamic	No data available
Viscosity, kinematic	No data available
s. Molecular weight	98.06 g/mol

SECTION 10: Stability and reactivity

a. Chemical stability

No data available

b. Possibility of hazardous reactions

Exothermic reaction with:

Alkali metals

alkali hydroxides

Amines

strong alkalis

pyridine

alkaline earth hydroxides

Alcohols

Water

Oxidizing agents

sodium carbonate

with

Heat.

Generates dangerous gases or fumes in contact with:

ammonium compounds

c. Conditions to avoid

Strong heating.

d. Incompatible products

Strong oxidizing agents

e. Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Carbon oxides

Other decomposition products - No data available

Thermal decomposition

No data available

SECTION 11: Toxicological information

a. Information on likely routes of exposure

No data available

b. Delayed and immediate effects and also chronic effects from short and long term exposure

Acute toxicity

LD50 Oral - Rat - male and female - 1,090 mg/kg

Inhalation: No data available

LD50 Dermal - Rabbit - female - 2,620 mg/kg

Remarks: (ECHA)

Skin corrosion/irritation

Skin - Rabbit - Causes burns. - 4 h

Remarks: (ECHA)

Serious eye damage/eye irritation

Eyes - Rabbit - Corrosive

Remarks: (ECHA)

Respiratory or skin sensitization

Local lymph node assay (LLNA) - Mouse - positive - OECD Test Guideline 429

The product is a skin sensitizer, sub-category 1A.

(ECHA)

May cause allergy or asthma symptoms or breathing difficulties if inhaled.

Carcinogenicity

No data available

Germ cell mutagenicity

Genotoxicity in vitro

Test Type: Ames test

Test system: Salmonella typhimurium

Metabolic activation: with and without metabolic activation

Method: OECD Test Guideline 471

Result: negative

Genotoxicity in vivo

Test Type: Chromosome aberration test

Species: Rat

Cell type: Bone marrow

Application Route: Inhalation

Method: OECD Test Guideline 475

Result: negative

Reproductive toxicity

No data available

Specific target organ toxicity - single exposure

Corrosive to the respiratory tract.

Specific target organ toxicity - repeated exposure

Inhalation - Causes damage to organs through prolonged or repeated exposure. -
Respiratory system

Aspiration hazard

No data available

Signs and Symptoms of Exposure

Cough, Shortness of breath, Headache, Nausea, Vomiting

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

c. Numerical measures of toxicity

No data available

Additional Information

Repeated dose toxicity - Rat - male - Oral - 90 Days - LOAEL (Lowest observed adverse effect level) - 100 mg/kgRemarks: (ECHA)

Repeated dose toxicity - Rat - male and female - Oral - 90 d - NOAEL (No observed adverse effect level) - 40 mg/kgRemarks: Subchronic toxicity

RTECS: ON3675000

SECTION 12: Ecological information

a. Ecotoxicity effects

Toxicity to fish	static test LC50 - Oncorhynchus mykiss (rainbow trout) - 75 mg/l - 96 h (OECD Test Guideline 203)
Toxicity to daphnia and other aquatic invertebrates	static test EC50 - Daphnia magna (Water flea) - 42.81 mg/l - 48 h (OECD Test Guideline 202) Remarks: (in analogy to similar products) The value is given in analogy to the following substances: maleic acid
Toxicity to algae	static test ErC50 - Pseudokirchneriella subcapitata (green algae) - 74.35 mg/l - 72 h (OECD Test Guideline 201) Remarks: (in analogy to similar products) The value is given in analogy to the following substances: maleic acid

b. Elimination information (persistence and degradability)

Biodegradability	aerobic - Exposure time 28 d Result: > 90 % - Readily biodegradable. (OECD Test Guideline 301B) Remarks: (in analogy to similar products) The value is given in analogy to the following substances: maleic acid
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c. Bioaccumulative potential

No data available

d. Mobility in soil

No data available

e. Other adverse effects

No data available

SECTION 13: Disposal considerations**a. Disposal 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. See www.retrologistik.com for processes regarding the return of chemicals and containers, or contact us there if you have further questions.

SECTION 14: Transport information**IMDG**

UN number: 2215 Class: 8 Packing group: III EMS-No: F-A, S-B
Proper shipping name: MALEIC ANHYDRIDE

IATA

UN number: 2215 Class: 8 Packing group: III
Proper shipping name: Maleic anhydride

SECTION 15: Regulatory information**a. Regulation under the Occupational Safety and Health Act**

Harmful Substances Required Permission for Manufacture - Not applicable

Harmful Substances Prohibited from Manufacturing - Not applicable

Harmful Agents to be kept below Occupational Exposure Limits - Not applicable

Controlled Substances Subject to Environment Monitoring - maleic anhydride, CAS 108-31-6

Controlled Substances Subject to Health Examination - maleic anhydride, CAS 108-31-6

Hazardous substances requiring management - maleic anhydride, CAS 108-31-6

Special Management Materials - Not applicable

b. Act on the Registration and Evaluation, etc. of Chemical Substances, Chemicals Control Act

Toxic Chemicals - Not applicable

Restricted Chemicals - Not applicable

Prohibited Chemicals - Not applicable

Accident Precaution Chemicals - Not applicable

c. Dangerous Substances Safety Management Act

Not Applicable to Dangerous Materials

d. Waste Control Act

Follow article 13 of the act to dispose the product waste

e. Other regulations

KECI Number

On the inventory, or in compliance with the inventory

SECTION 16: Other information

a. List of references

b. Issuing date: 2019.10.23

c. Version: 6.3 Revision Date 2022.04.22

e. Further information

Text of H-code(s) and R-phrases(s) mentioned in Section 3

H302	Harmful if swallowed.
H314	Causes severe skin burns and eye damage.
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H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H372	Causes damage to organs through prolonged or repeated exposure if inhaled.

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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