Issue date: 10/22/2003
Revision date: 4/4/2024

Safety Data Sheet

1. Chemical product and company identification

Product name	:	Maleic anhydride

Company information

Name of manufacturer	:	KANTO CHEMICAL CO., INC.
Address	:	2-1, Nihonbashi, Muromachi 2-Chome, Chuo-Ku, Tokyo, 103-0022, JP
Name of section	:	Business Administration Department, Reagent Division
Telephone number	:	+81-3-6214-1090
Facsimile number	:	+81-3-3241-1047
Mail address	:	BC32@kanto.co.jp
Reference No	:	25042
Product numbers applied by the SDS	:	25042, 25898
Recommended use	:	For research use only
Restrictions on use	:	Seek expert judgment when using the product for applications other than those recommended.

2. Hazards identification

GHS classification

Physical hazards	Self-reactive substances and mixtures	Type G
Health hazards	Acute toxicity (oral)	Category 4
	Skin corrosion/irritation	Category 1C
	Serious eye damage/eye irritation	Category 1
	Respiratory sensitization	Category 1
	Skin sensitization	Category 1
	Specific target organ toxicity (single exposure)	Category 1 (respiratory organs、digestive tract、liver)
	Specific target organ toxicity (repeated exposure)	Category 1 (respiratory organs, blood)
	Specific target organ toxicity (repeated exposure)	Category 2 (kidney)
Environmental hazards	Aquatic acute	Category 3
	Aquatic chronic	Category 3

Hazard pictograms



Signal word : Danger

Hazard statements : Harmful if swallowed
Causes severe skin burns and eye damage
May cause an allergic skin reaction
May cause allergy or asthma symptoms or breathing difficulties if

inhaled.
Causes damage to organs (respiratory organs、digestive tract、liver)
Causes damage to organs (respiratory organs, blood) through prolonged or repeated exposure
May cause damage to organs (kidney) through prolonged or repeated exposure
Harmful to aquatic life
Harmful to aquatic life with long lasting effects

Precautionary statements

Prevention	:	Do not breathe dust. Wash hands, forearms and face thoroughly after handling. Do not eat, drink or smoke when using this product. Contaminated work clothing should not be allowed out of the workplace. Avoid release to the environment. Wear protective gloves/protective clothing/eye protection/face protection. [In case of inadequate ventilation] wear respiratory protection.
Response	:	IF SWALLOWED: Call a POISON CENTER or doctor if you feel unwell. IF SWALLOWED: Rinse mouth. Do not induce vomiting. IF ON SKIN: Wash with plenty of water. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water . IF INHALED: Remove person to fresh air and keep comfortable for breathing. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. IF exposed or concerned: Call a POISON CENTER or doctor. Immediately call a POISON CENTER or doctor. Get medical advice/attention if you feel unwell. Rinse mouth. If skin irritation or rash occurs: Get medical advice/attention. If experiencing respiratory symptoms: Call a POISON CENTER or doctor. Take off contaminated clothing and wash it before reuse.
Storage	:	Store locked up.
Disposal	:	Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation.

3. Composition/information on ingredients

Distinction of substance or mixture	:	Substance
Synonyms	:	2,5-Furandione

Chemical name	Concentration (%)	Formula	TSCA	EC-No.	CAS RN
Maleic anhydride	≥ 98	C4H2O3	Listed	203-571-6	108-31-6

4. First aid measures

First aid measures

First-aid measures after inhalation : Remove the victim to fresh air, and make him blow his nose and gargle.

First-aid measures after skin contact : Wash the affected areas under running water.

First-aid measures after eye contact : Wash the affected areas under running water for at least 15 minutes. Get medical treatment.

First-aid measures after ingestion : Give the victim one or two glasses of water or milk. Do not induce vomiting. Get medical treatment.

Personal Protection in First Aid and Measures : Rescuers should wear proper protective equipment like rubber gloves, goggles.

Most Important Symptoms/Effects

Symptoms/effects : If inhaled the dust, cause burning sensation, cough, throat ache, shortness of breath, wheezing.

5. Fire fighting measures

Suitable extinguishing media : Dry chemical, CO2, dry sand, or alcohol-resistant foam

Unsuitable extinguishing media : Water spray, Foam extinguisher

Fire hazard : Upon contact with water, it easily hydrolyzes to produce corrosive maleic acid.

Firefighting instructions : Move containers from fire area if it can be done without risk, if not possible, apply water from a safe distance to cool and protect surrounding area.

Fight fire from windward.

Dry chemical powder, carbon dioxide or dry sand should be used for small fires. Alcohol-resistant foam extinguisher is effective for a large scale fire.

Personal protection (Emergency response) : Wear breathing apparatus.

6. Accidental release measures

Personal Precautions, Protective Equipment and Emergency Procedures

General measures : Wear proper protective equipment and avoid contact with skin and inhalation of dust. Conduct operations from upwind and evacuate people downwind.

Environmental precautions

Environmental precautions : Attention should be given to avoid damage to the environment by flowing of spillage to rivers.

Methods and Equipment for Containment and Cleaning up

For containment : Sweep up in a chemical waste container. Flush contaminated area with copious amounts of water.

Prevention Measures for Secondary Accidents : Remove nearby sources of ignition and prepare extinguishing media.

7. Handling and storage

Handling

Technical measures	:	Wear appropriate protective equipment to avoid contact with skin or inhalation of dust.
Precautions for safe handling	:	Avoid formation of dust and aerosols.

Storage

Storage conditions	:	Store in a dark, cool place and tightly closed.
Material used in packaging/containers	:	Glass, polyethylene, polypropylene.

8. Exposure controls / Personal protection equipment

ACGIH TWA	0.01 mg/m³ (IFV)

Appropriate engineering controls	:	Install a local ventilation system in case of dusty condition.

Protective equipment

Respiratory protection	:	If necessary, wear dust mask
Hand protection	:	Impervious protective gloves
Eye protection	:	Safety goggles
Skin and body protection	:	Protective clothing, protective boots

9. Physical and chemical properties

Physical state	:	Solid
Color	:	White
Odor	:	Pungent.
pH	:	The aqueous solution is acidic.
Melting point	:	52 - 54 ° C
Freezing point	:	No data available
Boiling point	:	202 ° C
Flash point	:	102 ° C (C.C.)
Auto-ignition temperature	:	477 ° C
Decomposition temperature	:	No data available
Flammability	:	Flammable solid
Vapor pressure	:	0.13 hPa (20℃)
Relative density	:	1.48
Density	:	No data available
Relative gas density	:	3.38
Solubility	:	Decomposes by water. Organic solvents: Soluble in acetone, chloroform, ethyl acetate, benzene.
Partition coefficient n-octanol/water (log Pow)	:	1.62
Explosive limits (vol %)	:	1.4 - 7.1 vol %
Viscosity, kinematic	:	No data available
Particle characteristics	:	No data available

10. Stability and reactivity

Reactivity	:	Hydrolysis produces maleic acid, and alcoholic decomposition produces esters. A Diels-Alder reaction is carried out with a compound having a conjugated double bond to produce a cyclohexene dicarboxylic acid. Reacts with ammonia or amines under pressure to produce aspartic acid.
Chemical stability	:	Stable under normal conditions. Sublimate.
Possibility of hazardous reactions	:	When it comes into contact with alkali metals or alkaline earth metals at temperatures above 150℃, it explosively decomposes while generating carbon dioxide.
Conditions to avoid	:	Light, heat.
Incompatible materials	:	Water, oxidizing substances.
Hazardous decomposition products	:	Carbon monoxide.

11. Toxicological information

Acute toxicity (oral)	:	Harmful if swallowed rat LD50=400mg/kg
Acute toxicity (dermal)	:	No classification rabbit LD50=2620mg/kg
Acute toxicity (inhalation)	:	No classification (gas) No classification (vapor) Classification not possible (dust, mist)
Skin corrosion/irritation	:	Causes severe skin burns There is the description in the report on rabbit skin irritation tests, since application of wet powder with water caused necrosis (though the results are not those of 4-hour application), it was classified into category 1C.
Serious eye damage/irritation	:	Causes serious eye damage Based on the descriptions in the reports on rabbit eye irritation tests, severe irritation, and occasionally, irreversible damage were observed, it was classified into category 1.
Respiratory sensitization	:	May cause allergy or asthma symptoms or breathing difficulties if inhaled. Since it is classified as an airway sensitizing substance (group 2) according to the recommendation of the allowable concentration of the Japan Society for Occupational Health, it was classified into category 1.
Skin sensitization	:	May cause an allergic skin reaction Since it is classified as a skin sensitizing substance (group 2) according to the recommendation of the allowable concentration of the Japan Society for Occupational Health, it was classified into category 1.
Germ cell mutagenicity	:	No classification As for in vivo, there are negative data on chromosome aberration test in rat bone marrow cells. As for in vitro, there are negative data on reverse mutation test in bacteria.
Carcinogenicity	:	No classification ACGIH classifies it as the group A4 (not classifiable as a human carcinogen).

Reproductive toxicity	:	No classification In the two-generation reproductive toxicity study by orally administered to rats, there is the description that since adverse effects were not observed on reproduction and development up to dose levels producing parental toxicity, it was set into ” No classification″.
STOT-single exposure	:	Causes damage to organs (respiratory organs、digestive tract、liver) There is the description that showed irritation to nose, throat and causes bronchitis, emphysema, asthma in severe cases at humans, so it was classified into category 1 (respiratory organs). On the other hand, in oral administration of rat or dog in experimental animals, acute inflammation of the digestive tract by the gastrointestinal mucosa stimulated, hematemesis, bloody stool were observed, and in the oral administration of rat, bleeding of the lung and liver were observed at dosage (180-256mg/kg) of the guidance value of category 1. therefore it was classified into category 1 (digestive tract, liver).
STOT-repeated exposure	:	Causes damage to organs (respiratory organs, blood) through prolonged or repeated exposure May cause damage to organs (kidney) through prolonged or repeated exposure There is the report that in occupational exposure by inhalation in humans, respiratory symptoms (cough, rhinitis, breathlessness, wheezing) were observed. Furthermore, there is the report that humans who received occupational exposure by inhalation, causes resulted in hemolytic anemia, hemolytic anemia in humans is judged the effects by the repeated exposure of this substance. In addition, in the 90-day oral (dietary) administration studies to rats in experimental animals, effects on the kidney (swelling of the kidney, fading, tubule diffuse extension, modification, etc.) were observed at dosage of upper limit (100mg/kg/day), which is corresponding to the guidance value of category 2. From the above mention, it was classified into category 1 (respiratory organs, blood), and category 2 (kidney).
Aspiration hazard	:	Classification not possible

12. Ecological information

Ecotoxicity

Aquatic acute	:	Harmful to aquatic life Oncorhynchus mykiss LC50=75mg/L/96h
Aquatic chronic	:	Harmful to aquatic life with long lasting effects

Persistence and degradability

Not readily biodegradable
BOD : 54.8%

Bioaccumulative potential

Low bioconcentration
BCF : 5

Mobility in soil

High mobility
Koc : 1

Hazardous to the ozone layer

Ozone	:	Classification not possible

13. Disposal considerations

Ecological waste information	:	Mixed with flammable organic solvents and burn in a chemical incinerator equipped with an afterburner and a scrubber. Or entrust approved waste disposal companies with the disposal.
Contaminated container and packaging	:	In case of disposal of empty bottles, dispose bottles after removing the content thoroughly.

14. Transport information

International Regulations

Transport by sea(IMDG)

UN-No. (IMDG)	:	2215
Proper Shipping Name (IMDG)	:	MALEIC ANHYDRIDE
Packing group (IMDG)	:	III
Transport hazard class(es) (IMDG)	:	8

Air transport(IATA)

UN-No. (IATA)	:	2215
Proper Shipping Name (IATA)	:	Maleic anhydride
Packing group (IATA)	:	III
Transport hazard class(es) (IATA)	:	8
Marine pollutant	:	Not applicable

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Pollutant category	:	Y
MFAG-No	:	156

15. Regulatory information

Regulatory information with regard to this substance in your country or region should be examined by your own responsibility.

16. Other information

Data sources	:	Dictionary of Organic Compounds, The society of Synthetic Organic Chemistry, Kodansha Ltd. (1985) . Encyclopaedia Chimica, Kyoritsu Shuppan Co, Ltd. (1963) . Handbook of Dangerous Substances Springer-Verlag Tokyo (1991) . Handbook of 17322 Chemical Products, The Chemical Daily Co. (2022) . NITE Chemical Risk Information Platform (NITE-CHRIP), National Institute of Technology and Evaluation.

The information contained herein is based on several references and the present state of our knowledge. However the SDS does not always cover all information about the product, handle the product carefully.The information is intended to ordinary usage, in case of particular handlings, conduct appropriate safety measurements.The information herein is only provision of information, and it does not represent a guarantee the properties of the product.The Safety Data Sheet(SDS) is prepared based on JIS Z7253.