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Safety Data Sheet

1. Chemical product and company identification

Product name : 1,3-Dioxolane

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 : 11016
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	Flammable liquids	Category 2
Health hazards	Serious eye damage/eye irritation	Category 2A
	Reproductive toxicity	Category 2

Hazard pictograms

Signal word : Danger

Hazard statements : Highly flammable liquid and vapor
Causes serious eye irritation
Suspected of damaging fertility or the unborn child

Precautionary statements

Prevention : Do not handle until all safety precautions have been read and understood.
Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
Keep container tightly closed.
Ground and bond container and receiving equipment.
Use explosion-proof electrical/ventilating/lighting equipment.
Use only non-sparking tools.
Take action to prevent static discharges.
Wash hands, forearms and face thoroughly after handling.
Wear protective gloves/protective clothing/eye protection/face protection.

Response : IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water .
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: Get medical advice/attention.
If eye irritation persists: Get medical advice/attention.

Storage : Store in a well-ventilated place. Keep cool.
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

Chemical name	Concentration (%)	Formula	TSCA	EC-No.	CAS RN
1,3-Dioxolane	≥ 98	C3H6O2	Listed	211-463-5	646-06-0

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. If necessary, get medical treatment.

First-aid measures after ingestion : The chemical is volatile. Do not induce vomiting because it increases the risk of aspiration into the lungs. Get medical attention immediately. If necessary, rinse mouth with water.

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

5. Fire fighting measures

Suitable extinguishing media : Water, dry chemical powder, carbon dioxide, dry sand, foam

Unsuitable extinguishing media : None

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. 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 vapor. Conduct operations from upwind and evacuate people downwind. Remove all sources of ignition. Keep away

personnel except for authorized ones from spillage area by stretching ropes.

Environmental precautions

Environmental precautions	:	Attention should be given to avoid discharge of spilled product into rivers and resulting environmental damage. When diluting spill with large amounts of water, discharge of untreated wastewater into the environment must be avoided.

Methods and Equipment for Containment and Cleaning up

For containment	:	Absorb spill with inert material (e.g, diatomaceous earth, sand) and flush spillage 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 proper protective equipment to avoid contact with skin or inhalation of vapor. Fire is strictly prohibited. Ventilate well at working places.
Precautions for safe handling	:	Use with an enclosed system or a local exhaust ventilation. Use in well-ventilated areas. Do not allow contact with oxidizing substances.

Storage

Storage conditions	:	Store in a dark, cool place and tightly closed.
Material used in packaging/containers	:	Glass, fluorine resin, stainless steel. Do not use vinyl chloride resin, acrylic resin, polystyrene etc.

8. Exposure controls / Personal protection equipment

ACGIH TWA	20 ppm

Appropriate engineering controls	:	Use with an enclosed system or a local exhaust ventilation.

Protective equipment

Respiratory protection	:	If necessary, wear chemical cartridge respirator with an organic vapor cartage
Hand protection	:	Impervious protective gloves
Eye protection	:	Safety goggles
Skin and body protection	:	Protective clothing, protective boots

9. Physical and chemical properties

Physical state	:	Liquid
Color	:	Colorless.
Odor	:	Slight characteristic
pH	:	No data available
Melting point	:	-95 ° C
Freezing point	:	No data available
Boiling point	:	74 ° C

Flash point	:	-5 ° C (C.C.)
Auto-ignition temperature	:	274 ° C
Decomposition temperature	:	No data available
Flammability	:	Flammable
Vapor pressure	:	105 hPa (20℃)
Relative density	:	No data available
Density	:	1.064 - 1.069 g/cm³ (20℃)
Relative gas density	:	2.55
Solubility	:	Water: Miscible. Organic solvents: Soluble in ethanol, diethyl ether, acetone.
Partition coefficient n-octanol/water (log Pow)	:	-0.37
Explosive limits (vol %)	:	2.3 - 30.5 vol %
Viscosity, kinematic	:	No data available
Particle characteristics	:	No data available

10. Stability and reactivity

Reactivity	:	It has cationically polymerizable properties.
Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	May react violently when in contact with oxidaizing substances.
Conditions to avoid	:	Light, heat.
Incompatible materials	:	Oxidizing substances.
Hazardous decomposition products	:	Carbon monoxide.

11. Toxicological information

Acute toxicity (oral)	:	No classification rat LD50=5200mg/kg
Acute toxicity (dermal)	:	No classification rabbit LD50=8480mg/kg
Acute toxicity (inhalation)	:	No classification (gas) No classification (vapor) rat LC50=22574ppm/4h Classification not possible (dust, mist)
Skin corrosion/irritation	:	No classification Based on a description that it was irritating to the skin in human, and a report that in a skin irritation test with rabbits, it caused mild erythema and edema on intact and abraded skin, it was classified as "No classification".
Serious eye damage/irritation	:	Causes serious eye irritation Based on a description that it was severely irritating to the eyes in humans, and a report that in an eye irritation test with rabbits, it caused conjunctival redness, corneal ulcers and opacity, iris irritation, and conjunctival edema, and these lesions remained even after 72 hours, and the severity score was 8 out of 10 grades, it was classified into category 2A.
Respiratory sensitization	:	Classification not possible

Skin sensitization	:	Classification not possible In a skin sensitization test with rabbits, there was a statement that irritation was observed when the skin was repeatedly exposed, but allergic dermatitis was not observed. However, since it was only one case, and details on the experimental conditions and the results were unclear, it was classified as "Classification not possible."
Germ cell mutagenicity	:	No classification As for in vivo, there are reports that it was negative in dominant lethal tests with rats, and negative (GLP compliance test) and positive (one case) in micronucleus tests with mouse bone marrow cells. As for in vitro, it was negative in all of the bacterial reverse mutation tests, and a mouse lymphoma test and a chromosomal aberration test with mammalian cultured cells. From the above, since the negative result was obtained in the in-vivo mouse micronucleus test, which was conducted according to GLP, it was judged that the result of the micronucleus test was negative.
Carcinogenicity	:	Classification not possible
Reproductive toxicity	:	Suspected of damaging fertility or the unborn child Regarding reproductive effects and developmental effects in experimental animals, there are reports that it was negative, while there are reports that it has clear effects, therefore, it was judged as appropriate that it was classified into category 2 for this hazard class.
STOT-single exposure	:	Classification not possible There is no information on single exposure to this substance in humans. In experimental animals, there is a report that in a single oral administration test with rats, a decrease in a respiration rate, and a decrease in motor activity at 2500 mg/kg exceeding the range for category 2, and tremors, piloerection, and prostration in addition to the above symptoms at 3500 mg/kg were observed. In addition, there is a report that in a 4-hour single inhalation exposure test with rats, respiratory and neuromuscular abnormalities were observed during exposure and during the observation period of 4 hours after exposure, and at necropsy, discoloration of the lung and liver was observed. Although there is no detailed description of the dose at which these symptoms were observed in this test, the LC50 value was reported as 68.4 mg/L, which was above category 2, so the effects were thought to be seen around the LC50 value exceeding category 2. Since the dose at which the toxic effects were observed in either of routes was a level exceeding the range for category 2, it was classified as "Classification not possible."

STOT-repeated exposure	:	Classification not possible No information on humans is available. In a 13-week inhalation toxicity test (6 hours/day, 5 days/week) with rats, a decrease in the leucocyte count, a decrease in the spleen weight, and an increase in the relative liver weight at or above 1000 ppm exceeding the guidance value range (vapour) for category 2, and a decrease in agility, minor swelling of centrilobular hepatocytes and eosinophilia of cytoplasm in the liver at 3000 ppm were observed. Also, in a 14-day repeated dose toxicity test with rats dosed by gavage, suppressed body weight gain and decrease in the platelet count at or above 250 mg/kg/day within the guidance value for category 2, an increase of relative liver weight, and a decrease in relative weight of the spleen and thymus at or above 750 mg/kg/day exceeding the guidance value range for category 2, and death, increased relative kidney weight, hypertrophy/vacuolation of the hepatocytes, thymic atrophy, and an increase in basophils in the cortical renal tubules, dilatation, and acute pyelitis in the kidney, etc. at 2000 mg/kg/day were observed. From the above, since the effects seen within the guidance value range for category 2 were insufficient for evidence for classification, it was classified as "Classification not possible."
Aspiration hazard	:	Classification not possible

12. Ecological information

Ecotoxicity

Aquatic acute	:	No classification Daphnia magna EC50=6950mg/L/48H
Aquatic chronic	:	No classification

Persistence and degradability

Not readily biodegradable
BOD : 2%

Bioaccumulative potential

Low bioconcentration
BCF : 3

Mobility in soil

High mobility
Koc : 15

Hazardous to the ozone layer

Ozone	:	Classification not possible

13. Disposal considerations

Ecological waste information	:	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)	:	1166
Proper Shipping Name (IMDG)	:	DIOXOLANE
Packing group (IMDG)	:	II
Transport hazard class(es) (IMDG)	:	3

Air transport(IATA)

UN-No. (IATA)	:	1166
Proper Shipping Name (IATA)	:	Dioxolane
Packing group (IATA)	:	II
Transport hazard class(es) (IATA)	:	3
Marine pollutant	:	Not applicable
MFAG-No	:	127

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 : Encyclopaedia Chimica, Kyoritsu Shuppan Co, Ltd. (1963) .
Dictionary of Organic Compounds, The society of Synthetic Organic Chemistry, Kodansha Ltd. (1985) .
Handbook of Dangerous Substances Springer-Verlag Tokyo (1991) .
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.