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Safety Data Sheet

1. Chemical product and company identification

Product name : METHANOL

Company information

Name of manufacturer : KANTO CHEMICAL CO., INC.
Address : 2-1, Nihonbashi, Muromachi 2-Chome, Chuo-Ku, Tokyo, 103-0022, Japan
Name of section : Electronic materials division technical department
Telephone number : +81-3-6214-1080
Facsimile number : +81-3-3241-1043
Mail address : el-info@kanto.co.jp
Reference No : GE00019 1.1
Recommended uses and restrictions : Electronic chemicals

2. Hazards identification

GHS classification

Physical hazards	Flammable liquids	Category 2
Health hazards	Acute toxicity (oral)	Category 4
	Serious eye damage/eye irritation	Category 2A
	Reproductive toxicity	Category 1B
	Specific target organ toxicity (single exposure)	Category 1 (central nervous system, visual organs, systemic toxicity)
	Specific target organ toxicity (single exposure)	Category 3 (narcosis)
	Specific target organ toxicity (repeated exposure)	Category 1 (central nervous system, visual organs)

Hazard pictograms

Signal word : Danger

Hazard statements :
Highly flammable liquid and vapor
Harmful if swallowed
Causes serious eye irritation
May cause drowsiness or dizziness
May damage fertility or the unborn child
Causes damage to organs (central nervous system, visual organs, systemic toxicity)
Causes damage to organs (central nervous system, visual organs) through prolonged or repeated exposure

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. Do not breathe mist/vapors. Wash hands, forearms and face thoroughly after handling. Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area. Wear protective gloves/protective clothing/eye protection/face protection.
Response	:	IF SWALLOWED: Call a POISON CENTER or doctor if you feel unwell. 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. IF exposed or concerned: Get medical advice/attention. Call a POISON CENTER or doctor if you feel unwell. Get medical advice/attention if you feel unwell. If eye irritation persists: Get medical advice/attention.
Storage	:	Store in a well-ventilated place. Keep container tightly closed. 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
Synonyms	:	Methyl alcohol

Chemical name	Concentration (%)	Formula	TSCA	EC-No.	CAS RN
Methanol	min. 99.9	CH3OH	Listed	200-659-6	67-56-1

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.

Most Important Symptoms/Effects

Symptoms/effects	:	Inhalation may cause cough, headache, dizziness, breath shortness, and nausea, theses symptoms may be late to develop.

5. Fire fighting measures

Suitable extinguishing media	:	Water, dry chemical powder, carbon dioxide, dry sand, alcohol resistant foam
Unsuitable extinguishing media	:	Foam extinguisher
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 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. Prevent build-up of electrostatic charges (e.g. by grounding).
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	:	Glass, fluorine resin, stainless steel.

packaging/containers	Do not use polyvinyl chloride resin, acrylic resin.

8. Exposure controls / Personal protection equipment

ACGIH TWA	200 ppm
ACGIH STEL	250 ppm
Remark (ACGIH)	Skin

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

Protective equipment

Respiratory protection : Chemical cartridge respirator with an organic vapor cartage or airline respirator

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 : Aromatic

pH : No data available

Melting point : -97.49 ° C

Freezing point : No data available

Boiling point : 64.51 ° C

Flash point : 12 ° C (C.C.)

Auto-ignition temperature : 470 ° C

Decomposition temperature : No data available

Flammability : Flammable

Vapor pressure : 128 hPa (20℃)

Relative density : No data available

Density : 0.793 g/cm³ (20℃)

Relative gas density : 1.1

Solubility : Water: Miscible.

Partition coefficient n-octanol/water (log Pow) : -0.82

Explosive limits (vol %) : 6 - 36.5 vol %

Viscosity, kinematic: : 0.75 mm²/s (20℃)

Particle characteristics : No data available

10. Stability and reactivity

Reactivity : Combines with calcium chloride to form a crystalline substance. It also binds to barium oxide to form a compound soluble in methanol. Formaldehyde is produced by air oxidation.

Chemical stability : Stable under normal conditions.

Possibility of hazardous reactions : May react violently when in contact with oxidizing substances.

Conditions to avoid	:	Light, heat.
Incompatible materials	:	Oxidizing substances.
Hazardous decomposition products	:	Carbon monoxide.

11. Toxicological information

Acute toxicity (oral)	:	Harmful if swallowed rat LD50=6200mg/kg human LD50=1400mg/kg As the result of animal experiments, acute oral toxicity was not classified, however, the toxic effects of methanol in primates is more pronounced, therefore it was classified into category 4.
Acute toxicity (dermal)	:	No classification rabbit LD50=15800mg/kg
Acute toxicity (inhalation)	:	No classification (gas) No classification (vapor) Classification not possible (dust, mist)
Acute toxicity (vapor) - Description	:	rat LC50>31500ppm/4h
Skin corrosion/irritation	:	Classification not possible Although there is an unpublished report that when applied to the skin of rabbits under occlusive conditions for up to 20-hour the substance was not irritating, classification was not possible due to lack of data in a skin irritation test. As relevant information, although there is a report that application to rabbit skin for 24-hour under occlusive conditions caused moderate skin irritation, this irritation was probably a result of the defatting action of methanol.
Serious eye damage/irritation	:	Causes serious eye irritation In a rabbit Draize test, mean scores of conjunctivitis were judged to be 2 and higher (2.1) at 24, 48 and 72-hour after installation. Chemosis (score of 2.00) observed up to 4-hour had decreased significantly by 72-hour (score of 0.50). Since it is not clear whether the effects reversed within 7 days, sub-categorization was not performed. Based on the data, the substance was classified into category 2A.
Respiratory sensitization	:	Classification not possible
Skin sensitization	:	No classification Based on the description that Methanol has no skin sensitization by maximization test using guinea pig, it was classified as "No classification".
Germ cell mutagenicity	:	No classification Methanol is negative in mouse erythrocyte micronucleus tests (in vivo somatic cell mutagenicity tests) by inhalation exposure and by intraperitoneal administration.
Carcinogenicity	:	Classification not possible

Reproductive toxicity	:	May damage fertility or the unborn child In a developmental toxicity test by inhalation exposure to mice during organogenesis period, fetal resorptions and exencephaly were observed. Additionally, similar effects including cleft palate were reported in other inhalation and oral exposure tests. For effects of methanol on reproduction, scientific decisions concerning health risks are generally based on what is known as weight-of-evidence approach. Recognizing the lack of human data and the clear evidence of laboratory animal effects, it was concluded that methanol may adversely affect human development if exposures are sufficiently high. Based on the information, the substance was considered to be a presumed human reproductive toxicant and it was classified into category 1B.
STOT-single exposure	:	Causes damage to organs (central nervous system, visual organs, systemic toxicity) May cause drowsiness or dizziness The symptoms of acute poisoning from the substance include CNS-depression. Formate accumulates in the blood during a latency period which leads to metabolic acidosis, visual impairment or even total blindness, headaches, dizziness, nausea, vomiting, Kussmaul breathing and coma. In some cases death is the final outcome. Further, CNS disorders, especially parkinsonism-like extrapyramidal symptoms were reported. Morphological changes, necrosis in the white substance of the brain were demonstrated. Based on the human information, the substance was classified into category 1 (central nervous system). Additionally, the eye was regarded as a target organ since visual impairment is a characteristic effect. Additionally, systemic toxicity is regarded as a target organ based on the reports of headache, nausea, vomiting, tachypnea and coma as signs of metabolic acidosis. The effects of single exposures by inhalation include narcosis. As an acute toxicity in humans, a narcotic effect results from central nervous system depression. Based on the data, the substance was classified into category 3 (narcosis).
STOT-repeated exposure	:	Causes damage to organs (central nervous system, visual organs) through prolonged or repeated exposure Based on a report that the most noted health consequence of longer-term exposure to lower levels of methanol is a broad range of ocular effects, and that cases of chronic poisoning from occupational exposure to methanol were manifested by bilateral blindness, it was classified into category 1 (visual organs). Additionally, based on the report that cases of chronic poisoning from repeated exposure to methanol vapour are manifested by headache, giddiness, insomnia, and gastric disturbances, it was classified into category 1 (central nervous system).
Aspiration hazard	:	Classification not possible

12. Ecological information

Ecotoxicity

Aquatic acute	:	No classification Crangon crangon LC50=1340mg/L/96h
Aquatic chronic	:	No classification

Persistence and degradability

Readily biodegradable
BOD : 92%

Bioaccumulative potential

Low bioconcentration
log Pow : -0.82

Mobility in soil

High mobility
Koc : 2.75

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) : 1230
Proper Shipping Name (IMDG) : METHANOL
Packing group (IMDG) : II
Transport hazard class(es) (IMDG) : 3 (6.1)

Air transport(IATA)

UN-No. (IATA) : 1230
Proper Shipping Name (IATA) : Methanol
Packing group (IATA) : II
Transport hazard class(es) (IATA) : 3 (6.1)

Marine pollutant : Not applicable

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

Pollutant category : Y
MFAG-No : 131

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 : Solvents Handbook, T, Asahara el, Kodansha Scientific Ltd. (1976) .
Handbook of dangeroous and hazardous chemicals, Japan Industrial Safety & Health Association. (2000-2001) .
Dangerous Properties of Industrial Materials,6th ed. N.I.Sax Van Nostrand Reinhold Company (1984) .

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.