

Safety Data Sheet

1. Chemical product and company identification

Product name : Tetrahydrofuran, dehydrated stabilizer free

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 : 41001
 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	Acute toxicity (oral)	Category 4
	Acute toxicity (inhalation:vapors)	Category 4
	Skin corrosion/irritation	Category 2
	Serious eye damage/eye irritation	Category 2A
	Carcinogenicity	Category 2
	Reproductive toxicity	Category 2
	Specific target organ toxicity (single exposure)	Category 1 (central nervous system)
	Specific target organ toxicity (single exposure)	Category 3 (narcosis)
	Specific target organ toxicity (single exposure)	Category 3 (respiratory tract irritation.)
	Specific target organ toxicity (repeated exposure)	Category 1 (central nervous system, respiratory oragans, liver)

Hazard pictograms



Signal word : Danger

Hazard statements : Highly flammable liquid and vapor
 Harmful if swallowed or if inhaled
 Causes skin irritation
 Causes serious eye irritation
 May cause respiratory irritation
 May cause drowsiness or dizziness



Suspected of causing cancer
Suspected of damaging fertility or the unborn child
Causes damage to organs (central nervous system)
Causes damage to organs (central nervous system, respiratory
organs, liver) 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. Take action to prevent static discharges. 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: 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. 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. Rinse mouth. If skin irritation occurs: Get medical advice/attention. If eye irritation persists: Get medical advice/attention. Take off contaminated clothing and wash it before reuse.
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	: THF, Diethylene oxide, Tetramethylene oxide



Chemical name	Concentration (%)	Formula	TSCA	EC-No.	CAS RN
Tetrahydrofuran	≥ 99.5	C ₄ H ₈ O	Listed	203-726-8	109-99-9

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. If necessary, get medical treatment.
- 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, 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 : Remove nearby sources of ignition and prepare extinguishing



Secondary Accidents

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.
Purge container with inert gas.
- Material used in packaging/containers : Glass, fluorine resin, stainless steel, copper.
Do not use polyvinyl chloride resin, polyethylene, polypropylene, polycarbonate.

8. Exposure controls / Personal protection equipment

ACGIH TWA	50 ppm
ACGIH STEL	100 ppm
Remark (ACGIH)	Skin

- 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 : Ethereal
- pH : Neutral
- Melting point : -108.5 ° C
- Freezing point : No data available
- Boiling point : 66 ° C
- Flash point : -17.2 ° C (C.C.)
- Auto-ignition temperature : 321.1 ° C
- Decomposition temperature : No data available
- Flammability : Flammable
- Vapor pressure : 200 hPa (20°C)
- Relative density : No data available
- Density : 0.884 - 0.889 g/cm³ (20°C)



Relative gas density	: 2.5
Solubility	: Water: Miscible.
Partition coefficient n-octanol/water (log Pow)	: 0.46
Explosive limits (vol %)	: 2.3 - 11.8 vol %
Viscosity, kinematic	: 0.62 mm ² /s (20°C)
Particle characteristics	: No data available

10. Stability and reactivity

Reactivity	: May react with oxidizing substances.
Chemical stability	: Stable under normal conditions.
Possibility of hazardous reactions	: Forms explosive peroxides by oxygen in air.
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=1650mg/kg
Acute toxicity (dermal)	: Classification not possible
Acute toxicity (inhalation)	: No classification (gas) Harmful if inhaled (vapor) rat LC50=18187ppm/4h Classification not possible (dust, mist)
Skin corrosion/irritation	: Causes skin irritation Following occlusive and open application of the substance to 6 persons, irritation was observed. In skin irritation tests in rabbits, guinea pigs, rats, and mice, the substance caused irritation. Thus, it was classified into category 2.
Serious eye damage/irritation	: Causes serious eye irritation From the description that the substance causes irritation to the eyes of humans, it was classified into category 2A.
Respiratory sensitization	: Classification not possible
Skin sensitization	: Classification not possible
Germ cell mutagenicity	: No classification As for in vivo, there are negative data on micronucleus examinations in mouse marrow erythrocytes and peripheral blood erythrocytes, chromosome aberration tests in mouse marrow cells, unscheduled DNA synthesis test in rat liver. As for in vitro, there are negative data on reverse mutation test in bacteria, chromosome aberration test, micronucleus examination and sister chromatid exchange test in cultured mammalian cells.
Carcinogenicity	: Suspected of causing cancer It is classified as A3 by ACGIH, "suggestive evidence of carcinogenic potential" by EPA. Thus, it was classified into category 2.
Reproductive toxicity	: Suspected of damaging fertility or the unborn child No effects on fertility or teratogenicity were observed. However, in mouse teratogenicity tests, decreased fetal viability was observed at dosing levels toxic to dams. Thus, it was classified into category 2.



STOT-single exposure	: Causes damage to organs (central nervous system) May cause drowsiness or dizziness May cause respiratory irritation The substance has airway stimulativeness. There is human evidence including "in inhalation exposure (vapor) at high concentration, it may adversely affect central nervous system, causing lethargy.", "in oral ingestion and inhalation exposure, cough, pharyngalgia, giddiness, headache, nausea and unconsciousness were observed." and "increased hepatic enzyme in blood, nausea, dizziness, lowered hearing ability, blood vessel edema, occipital headache and brain cramps were noted." Thus, it was classified into category 1 (central nervous system), category 3 (respiratory irritation, narcosis).
STOT-repeated exposure	: Causes damage to organs (central nervous system, respiratory organs, liver) through prolonged or repeated exposure There are many reports on human repeated exposure (occupational exposure), for example, central nervous system symptoms, respiratory organs symptoms, and hepatopathy. However, all these effects are combined exposure effects with other solvents and there is no clear relationship with concentration or exposure time. There is evidence from animal studies including "in 12-week inhalation exposure test in rats within the concentration range of category 2, increased serum AST was observed." and "in 13-week or 2-year inhalation exposure NTP test in rats and mice, at high concentration (out of category), the effects on liver and central nervous system symptoms were observed." Based on the above information, it was classified into category 1 (central nervous system, respiratory organs, liver).
Aspiration hazard	: Classification not possible

12. Ecological information

Ecotoxicity

Aquatic acute	: No classification Pimephales promelas LC50=2160mg/L/96h
Aquatic chronic	: No classification

Persistence and degradability

Readily biodegradable
BOD : 100%

Bioaccumulative potential

Low bioconcentration
log Pow : 0.46

Mobility in soil

High mobility
Koc : 4.9

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) : 2056
Proper Shipping Name (IMDG) : TETRAHYDROFURAN
Packing group (IMDG) : II
Transport hazard class(es) : 3

(IMDG)

Air transport(IATA)

UN-No. (IATA) : 2056
Proper Shipping Name (IATA) : Tetrahydrofuran
Packing group (IATA) : II
Transport hazard class(es) : 3

(IATA)

Marine pollutant : Not applicable

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

Pollutant category : Z
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 : Dictionary of Organic Compounds, The society of Synthetic Organic Chemistry, Kodansha Ltd. (1985) .
Solvents Handbook, T, Asahara et al, Kodansha Scientific Ltd. (1976) .
Dangerous Properties of Industrial Materials, 6th ed. N. I. Sax Van Nostrand Reinhold Company (1984) .
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.

