Issue date: 9/30/2003
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Safety Data Sheet

1. Chemical product and company identification

Product name	:	Cyclohexanone

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	:	07555
Product numbers applied by the SDS	:	07205, 07555
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 3
Health hazards	Acute toxicity (oral)	Category 4
	Acute toxicity (dermal)	Category 3
	Acute toxicity (inhalation:vapors)	Category 3
	Skin corrosion/irritation	Category 2
	Serious eye damage/eye irritation	Category 2A
	Skin sensitization	Category 1
	Germ cell mutagenicity	Category 2
	Reproductive toxicity	Category 2
	Specific target organ toxicity (single exposure)	Category 1 (respiratory organs)
	Specific target organ toxicity (single exposure)	Category 2 (central nervous system)
	Specific target organ toxicity (single exposure)	Category 3 (narcosis)
	Specific target organ toxicity (repeated exposure)	Category 1 (central nervous system, bone)

Hazard pictograms

Signal word : Danger

Hazard statements	:	Flammable liquid and vapor Harmful if swallowed Toxic in contact with skin or if inhaled Causes skin irritation May cause an allergic skin reaction Causes serious eye irritation May cause drowsiness or dizziness Suspected of causing genetic defects Suspected of damaging fertility or the unborn child Causes damage to organs (respiratory organs) May cause damage to organs (central nervous system) Causes damage to organs (central nervous system, bone) 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. Contaminated work clothing should not be allowed out of the workplace. 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. Call a POISON CENTER or doctor if you feel unwell. Get medical advice/attention if you feel unwell. Rinse mouth. If skin irritation or rash occurs: Get medical advice/attention. If eye irritation persists: Get medical advice/attention. Take off immediately all contaminated clothing and wash it before reuse. 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 : Ketocyclohexane

Chemical name	Concentration (%)	Formula	TSCA	EC-No.	CAS RN
Cyclohexanone	≥ 99	C6H10O	Listed	203-631-1	108-94-1

4. First aid measures

First aid measures

First-aid measures after inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately 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 : Dry chemical, CO2, dry sand, or alcohol-resistant foam

Unsuitable extinguishing media : Water spray, 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.
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
ACGIH STEL	50 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 - pale yellow
Odor	:	Camphor like odor
pH	:	No data available
Melting point	:	-45 ° C
Freezing point	:	No data available
Boiling point	:	155.65 ° C
Flash point	:	44 ° C (C.C.)

Auto-ignition temperature	:	420 ° C
Decomposition temperature	:	No data available
Flammability	:	Flammable
Vapor pressure	:	5.27 hPa (20℃)
Relative density	:	No data available
Density	:	0.944 - 0.948 g/cm³ (20℃)
Relative gas density	:	3.4
Solubility	:	Organic solvents: Soluble in ethanol. Water: 13 % (10℃)
Partition coefficient n-octanol/water (log Pow)	:	0.81
Explosive limits (vol %)	:	1.1 - 8.1 vol %
Viscosity, kinematic	:	2.3 mm²/s (25℃)
Particle characteristics	:	No data available

10. Stability and reactivity

Reactivity	:	Ring-opening when reacting with acid and oxidizing agent.
Chemical stability	:	Stable under normal conditions. Turns yellow after long-term storage.
Possibility of hazardous reactions	:	Stable under normal conditions of use.
Conditions to avoid	:	Light, heat.
Incompatible materials	:	Acids, oxidizing substances.
Hazardous decomposition products	:	Carbon monoxide.

11. Toxicological information

Acute toxicity (oral)	:	Harmful if swallowed rat LD50=1296mg/kg
Acute toxicity (dermal)	:	Toxic in contact with skin rabbit LD50=947mg/kg
Acute toxicity (inhalation)	:	No classification (gas) Toxic if inhaled (vapor) rat LC50=2450ppm/4h No classification (dust, mist) rat LC50=3.21mg/L/4h
Skin corrosion/irritation	:	Causes skin irritation Although there is a report that in a rabbit test with 2 samples of cyclohexanone, rabbits exhibited necrosis after occlusive application of one sample, then the sample was classified as corrosive, in an evaluation for corrosiveness in rabbits, no corrosion occurred in any rabbit. Application of the undiluted substance with open contact was non-irritating to rabbit skin. Additionally, although application of a 99% solution for 24-hour under occlusive conditions caused strong skin irritation, the effects slowly resolved and disappeared during a seven day period after application. Based on these evidences of non-corrosive, the substance was classified into category 2.

Serious eye damage/irritation	:	Causes serious eye irritation The undiluted substance placed in the eyes of rabbits produced marked irritation and corneal injury. When the undiluted substance was applied to rabbit eyes, corneal injury with mild iritis and conjunctivitis was reversible, but the eyes still showed mild corneal damage at 14 days. Based on these data, the substance was classified into category 2A.
Respiratory sensitization	:	Classification not possible
Skin sensitization	:	May cause an allergic skin reaction Since the substance is on the Frosch contact allergen list, the substance was classified into category 1.
Germ cell mutagenicity	:	Suspected of causing genetic defects Based on a positive result in a rat bone marrow chromosomal aberration test by subcutaneous injection (in vivo somatic cell mutagenicity test), the substance was classified into category 2.
Carcinogenicity	:	No classification IARC classifies it as group 3(not classifiable as to its carcinogenicity to humans).
Reproductive toxicity	:	Suspected of damaging fertility or the unborn child In a two-generation reproduction test in rats by inhalation exposure, toxic symptoms such as lacrimation, irregular breathing and ataxia was observed in the high dose group. In this group, there was a reduction in the number of offspring, which was interpreted by the authors as a decrease in male fertility, and reduced survival of the offspring. Based on the data, the substance was classified into category 2.
STOT-single exposure	:	Causes damage to organs (respiratory organs) May cause damage to organs (central nervous system) May cause drowsiness or dizziness Following oral administration of the substance to rats and mice, hypnotic signs appeared. As a symptom following inhalation exposure to guinea pigs and oral administration to rabbits, anesthesia is reported. Based on the data, the substance was classified into category 3 (narcosis). Since there are reports that a high concentration exposure resulted in deaths and that symptoms noted at acute toxic doses were CNS depression, the substance was classified into category 2 (central nervous system). Based on the findings of hemorrhage of lungs in rat by oral administration of 475 - 3800 mg/kg and lesions such as congestion and edema of the lungs, focal to diffuse hemorrhage of the lung parenchyma, the substance was classified into category 1 (respiratory organs).
STOT-repeated exposure	:	Causes damage to organs (central nervous system, bone) through prolonged or repeated exposure Neurotoxic effects were examined in a group of 75 workers from a furniture factory who were exposed while coating wood with cyclohexanone. The exposures were observed to cause an increase in the percentage of reported neurotoxic symptoms (mood disorders, memory difficulties, sleep disturbances, etc.). There is a report that the substance depresses the central nervous system. Based on these data, the substance was classified into category 1 (central nervous system). In the above mentioned examination, an increase in the percentage of reported rheumatic symptoms was observed. Out of these symptoms, bone pain was reported on another document. Therefore, the substance was classified into category 1 (bone).
Aspiration hazard	:	Classification not possible

12. Ecological information

Ecotoxicity

Aquatic acute	:	No classification Pimephales promelas LC50=527mg/L/96h
Aquatic chronic	:	No classification

Persistence and degradability

Readily biodegradable
BOD : 87%

Bioaccumulative potential

Low bioconcentaration
BCF : 2.4

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)	:	1915
Proper Shipping Name (IMDG)	:	CYCLOHEXANONE
Packing group (IMDG)	:	III
Transport hazard class(es) (IMDG)	:	3

Air transport(IATA)

UN-No. (IATA)	:	1915
Proper Shipping Name (IATA)	:	Cyclohexanone
Packing group (IATA)	:	III
Transport hazard class(es) (IATA)	:	3

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 : Solvents Handbook, T, Asahara el, Kodansha Scientific Ltd. (1976) .
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.