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Safety Data Sheet

1. Chemical product and company identification

Product name : 2-BUTANONE

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	:	GE00002 1.3
Recommended uses and restrictions	:	Electronic chemicals

2. Hazards identification

GHS classification

Physical hazards	Flammable liquids	Category 2
Health hazards	Acute toxicity (inhalation:vapors)	Category 4
	Skin corrosion/irritation	Category 2
	Serious eye damage/eye irritation	Category 2A
	Specific target organ toxicity (single exposure)	Category 2 (kidney)
	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 (nervous system)

Hazard pictograms

Signal word : Danger

Hazard statements :
Highly flammable liquid and vapor
Causes skin irritation
Causes serious eye irritation
Harmful if inhaled
May cause respiratory irritation
May cause drowsiness or dizziness
May cause damage to organs (kidney)
Causes damage to organs (nervous system) through prolonged or repeated exposure

Precautionary statements

Prevention	:	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 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. Call a POISON CENTER or doctor if you feel unwell. Get medical advice/attention if you feel unwell. 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	:	MEK, Ethyl methyl ketone, Methyl ethyl ketone

Chemical name	Concentration (%)	Formula	TSCA	EC-No.	CAS RN
2-Butanone	min. 99.9	C2H5COCH3	Listed	201-159-0	78-93-3

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. Get medical treatment.
First-aid measures after	:	The chemical is volatile. Do not induce vomiting because it increases the risk of aspiration into the lungs. Get medical

ingestion		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	:	Overexposure may cause anesthetic action, headache, dizziness, tunnel vision, nausea, or unconsciousness.

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)	:	Firefighters should wear protective equipment.

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. 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.
Precautions for safe handling	:	Use with an enclosed system or a local exhaust ventilation. Use in well-ventilated areas.

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	200 ppm
ACGIH STEL	300 ppm

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

Protective equipment

Respiratory protection : If necessary, wear gas mask for organic solvents or airline respirator.

Hand protection : Organic solvents resistant gloves

Eye protection : Safety goggles

Skin and body protection : Protective clothing, protective boots

9. Physical and chemical properties

Physical state : Liquid

Color : Colorless.

Odor : Acetone like odor

pH : No data available

Melting point : -86.7 ° C

Freezing point : No data available

Boiling point : 79.64 ° C

Flash point : -7.2 ° C

Auto-ignition temperature : 516 ° C

Decomposition temperature : No data available

Flammability : Flammable

Vapor pressure : 105 hPa (20℃)

Relative density : No data available

Density : 0.80 g/cm³ (20℃)

Relative gas density : 2.5

Solubility : Organic solvents: Miscible with many kinds of organic solvents.
Water: 21.1 % (20℃)

Partition coefficient n-octanol/water (log Pow) : 0.29

Explosive limits (vol %) : 1.18 - 11.5 vol %

Viscosity, kinematic: : 0.5 mm²/s (25℃)

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 : Stable under normal conditions of use.

Conditions to avoid : Light, heat.

Incompatible materials : Oxidizing substances.

Hazardous decomposition products : Carbon monoxide.

11. Toxicological information

Acute toxicity (oral)	:	No classification rat LD50=2737mg/kg
Acute toxicity (dermal)	:	No classification rabbit LD50>5000mg/kg
Acute toxicity (inhalation)	:	No classification (gas) Harmful if inhaled Classification not possible (dust, mist)
Acute toxicity (vapor) - Description	:	rat LC50=11700ppm/4h
Skin corrosion/irritation	:	Causes skin irritation Based on the description that mild to moderate irritation was observed in the skin irritation test on rabbits, it was classified into category 2.
Serious eye damage/irritation	:	Causes serious eye irritation Result of this material was applied to the eye of the rabbit, there is a report that severe irritation was observed, and bleeding of corneal disorder and sclera, edema of the eyelids, chemical burns were observed. In addition, the average value of the mark in 24 hours, was corneal cloudings was 2.5 and the conjunctival redness was 2 in the eye irritation examination using a rabbit, but it had recovered mostly within seven days, so, 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 tests, there are negative data on micronucleus assay in mouse bone marrow cells.
Carcinogenicity	:	No classification Since it was classified as I (inadequate) by EPA.
Reproductive toxicity	:	Classification not possible There are descriptions that fetal malformations were observed in teratogenicity studies of inhalation exposures in rats. In a retest, however, malformations are not observed, although delayed ossification and mutations were observed. Furthermore, malformation is not observed, although lower weight levels of offsprings and mutations were also observed in teratogenicity studies of inhalation exposure to mice. Therefore, all were judged to be minimum influence. However, since there is no report of the test related to fertility, it was not possible to classify.
STOT-single exposure	:	May cause damage to organs (kidney) May cause drowsiness or dizziness May cause respiratory irritation In humans, in the inhalation exposure, there is the report that causes headache, dizziness, nausea, vomiting, ataxia, eye blurred vision, lightheadedness, hyperventilation, dizziness, lethargy, central nervous system depressant action, metabolic acidosis, loss of consciousnes. In the oral administration, there is the report of loss of consciousness. In experimental animals, anesthetic action, mild renal tubular necrosis of the kidneys were recognized in the oral administration 1,080 mg/kg in rats. Effects on the kidneys of the rats was observed at doses ranging from category 2. This material is considered to have effects on the kidney, and respiratory tract irritation, the anesthetic action. From the above, it was classified into category 2((kidney), category 3 (respiratory tract irritation, narcosis).

STOT-repeated exposure	:	Causes damage to organs (nervous system) through prolonged or repeated exposure There is the description that numbness of the hands and arms were observed in human occupational exposure cases. And since there is the description that disorders of central nervous system are suggested in occupational exposure example, target organ is considered nervous system, it was classified into category 1(nervous system).
Aspiration hazard	:	Classification not possible This substance is a ketone composed of no more than 13 carbon atoms, and its kinematic viscosity was 0.50 mm2/s. Since it corresponds to category 2, it was classified as "Classification not possible" according to the Classification Guidance for the Japanese Government.

12. Ecological information

Ecotoxicity

Aquatic acute	:	No classification Oryzias latipes LC50>100mg/L/96h
Aquatic chronic	:	No classification Pseudokirchneriella subcapitata NOEC=93mg/L/72h

Persistence and degradability

Readily biodegradable
BOD : 89%

Bioaccumulative potential

Low bioconcentration
log Pow : 0.29

Mobility in soil

High mobility
Koc : 29.5-33.9

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)	:	1193
Proper Shipping Name (IMDG)	:	ETHYL METHYL KETONE (METHYL ETHYL KETONE)
Packing group (IMDG)	:	II

Transport hazard class(es) : 3
(IMDG)

Air transport(IATA)

UN-No. (IATA) : 1193
Proper Shipping Name (IATA) : Ethyl methyl ketone
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 el, 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.