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Safety Data Sheet

1. Chemical product and company identification

Product name : Triethyl phosphate

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	:	40915
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

Health hazards	Acute toxicity (oral)	Category 4
	Serious eye damage/eye irritation	Category 2A
	Reproductive toxicity	Category 2
	Specific target organ toxicity (single exposure)	Category 2 (nervous system)
	Specific target organ toxicity (single exposure)	Category 3 (narcosis)

Hazard pictograms

Signal word : Warning

Hazard statements : Harmful if swallowed
Causes serious eye irritation
May cause drowsiness or dizziness
Suspected of damaging fertility or the unborn child
May cause damage to organs (nervous system)

Precautionary statements

Prevention : Do not handle until all safety precautions have been read and understood.
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 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. Rinse mouth. If eye irritation persists: Get medical advice/attention.
Storage	:	Store in a well-ventilated place. Keep container tightly closed. 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	:	Ethyl phosphate

Chemical name	Concentration (%)	Formula	TSCA	EC-No.	CAS RN
Triethyl phosphate	≥ 98	C6H15O4P	Listed	201-114-5	78-40-0

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	:	Rinse mouth. Do not induce vomiting. Get medical attention immediately.
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)	:	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.
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	:	Avoid formation of vapor and aerosols. 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.

8. Exposure controls / Personal protection equipment

ACGIH TWA	Not established

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	:	Fruit like
pH	:	No data available
Melting point	:	-56.4 ° C
Freezing point	:	No data available
Boiling point	:	215 - 216 ° C
Flash point	:	115 ° C (O.C.)
Auto-ignition temperature	:	454 ° C
Decomposition temperature	:	No data available
Flammability	:	Flammable
Vapor pressure	:	20 Pa (20℃)
Relative density	:	No data available
Density	:	1.0695 g/cm³ (20℃)
Relative gas density	:	6.3
Solubility	:	Water: Miscible. Organic solvent: Soluble in ethanol and diethyl ether.
Partition coefficient n-octanol/water (log Pow)	:	0.8
Explosive limits (vol %)	:	No data available
Viscosity, kinematic	:	No data available
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, phosphorus oxides.

11. Toxicological information

Acute toxicity (oral)	:	Harmful if swallowed rat LD50=1131-1600 mg/kg
Acute toxicity (dermal)	:	No classification rat LD50>20 g/kg
Acute toxicity (inhalation)	:	No classification (gas) Classification not possible (vapor) No classification (dust, mist) rat LC50>8.817 mg/L/4h
Skin corrosion/irritation	:	No classification Moderate irritation was noted in 1 of 3 tested animals in the animal experiment (OECD TG 404, GLP-compliant), but SIDS concluded that the substance was not a skin irritant in accordance with guideline. The substance caused slight irritation to guinea pig, but caused non irritation to rabbit. Based on these documents, the substance was classified as "No classification".

Serious eye damage/irritation	:	Causes serious eye irritation In the rabbit test, transient conjunctivitis was noted. In other rabbit test, corneal opacity, iritis and corneal coloration were noted. Based on these documents, the substance was classified as category 2A. As relevant notes, in Draize tests using rabbits, instillation of 100 mg of substance caused moderate irritation, which was the "List 3" information source of GHS classification guidance for the Japanese government.
Respiratory sensitization	:	Classification not possible
Skin sensitization	:	No classification In a mouse local lymph node assay (LLNA) in accordance with OECD TG 429, the SI value was less than 3 and was reported as negative. Based on the above, it was classified as "No classification".
Germ cell mutagenicity	:	No classification The classification was concluded as "No classification" based on the negative results in the dominant lethal test using mice of 2 strains intraperitoneally administered (in vivo inheritable mutagenicity test in germ cells), chromosome aberration test using spermatogonia obtained from mice intraperitoneally administered (in vivo mutagenicity test in germ cells), and chromosome aberration test using bone marrow of mice (in vivo mutagenicity test in somatic cells). As relevant information, as for in vitro studies, negative results in the Ames test and HPRT test using V79 cells were reported.
Carcinogenicity	:	Classification not possible
Reproductive toxicity	:	Suspected of damaging fertility or the unborn child In the 2-generation feeding study in rats, which were administered from 92 days before mating to 120 days after mating for males, and to 150 days after mating for females, the litter size was reduced at the dose level (670 mg/kg/day) that did not induce general toxicity to parental animals. Therefore, the substance was classified as category 1B. However, there was a description that this experiment was study using few animals, and should be considered as a pilot study that suggested some adverse effects on the reproduction and development of rats. Therefore, the substance was concluded as category 2. As relevant information, the developmental toxicity study in rats showed no evidence of teratogenic potential up to the highest dose of 625 mg/kg/day.
STOT-single exposure	:	May cause damage to organs (nervous system) May cause drowsiness or dizziness There was a description stating that this substance was harmful and caused the narcotic effect, and showed obvious neurotoxicity (cholinesterase inhibition) without delayed neurotoxicity. In various experiments on acute toxicity the following symptoms of poisoning were observed: narcosis, excitations followed by depression of central nervous system, loss of muscular coordination and quadriplegia, etc.. Dogs treated with a single oral dose of 1070 mg/kg revealed lateral position, dyspnea, sedation, narcotic-like condition and twitching, then died on the day of administration. In addition, the other dogs received a single dose of 100 or 250 mg/kg caused sedation and slight tremor with inhibition of plasma cholinesterase. As described above, in addition to category 3 (narcotic effects), the classification was determined as category 2 (nervous system) because neurotoxic signs occurred in dogs at the dose level equivalent to category 2 of the guidance values.

STOT-repeated exposure	:	Classification not possible The NOAEL in the 28-day oral dose toxicity in rats was reported as 1000 mg/kg/day (converted dose level as that of 90-day study: 311 mg/kg/day). There were no adverse effects up to 5000 ppm (335 mg/kg/day) in the 92-day feeding study in rats, and there were also no serious toxicity at the concentration of 5000 ppm (330 mg/kg/day) in another 9-week feeding study in rats. While in the inhalation study exposed 12 times to rats (5 hours/day, 5 days/week) at the concentration of 1.786 mg/L as an aerosol (converted concentration as that of 90-day study: 0.275 mg/L), lethargy, reduced sensitivity to noise, behavioral disturbances, etc. were observed, however, hematological and biochemical parameters were within the ranges of the control group and no pathological changes were determined macroscopically or microscopically. Thus, no adverse effects were shown up to the doses beyond the guidance values in both oral and inhalation routes, which led to a conclusion as "No classification". However, since data for inhalation route were provided from the "List 2" information source designated in the GHS classification guidance for the Japanese government and the effects in dermal route was unknown due to no information, the classification for specific target organ toxicity (repeated exposure) was determined as "Classification not possible".
Aspiration hazard	:	Classification not possible

12. Ecological information

Ecotoxicity

Aquatic acute	:	No classification Daphnia magna EC50>100 mg/L/48h
Aquatic chronic	:	No classification

Persistence and degradability

Not readily biodegradable
BOD : 0%

Bioaccumulative potential

Low bioconcentration
BCF : 0.5-0.8 (1 mg/L), ≦1.3 (0.1 mg/L)

Mobility in soil

No additional information available

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)	:	Not applicable
Proper Shipping Name (IMDG)	:	Not applicable
Packing group (IMDG)	:	Not applicable
Transport hazard class(es) (IMDG)	:	Not applicable

Air transport(IATA)

UN-No. (IATA)	:	Not applicable
Proper Shipping Name (IATA)	:	Not applicable
Packing group (IATA)	:	Not applicable
Transport hazard class(es) (IATA)	:	Not applicable
Marine pollutant	:	Not applicable

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

Pollutant category	:	Z

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 : NITE Chemical Risk Information Platform (NITE-CHRIP), National Institute of Technology and Evaluation.
Dictionary of Organic Compounds, The society of Synthetic Organic Chemistry, Kodansha Ltd. (1985) .
ICSC Card (2009) .
ECHA (European Chemicals Agency).

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.