

Safety Data Sheet

1. Chemical product and company identification

Product name : TOLUENE

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 : GE00023 1.1
 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 2B
	Reproductive toxicity	Category 1A
	Reproductive toxicity (effects on or via lactation)	Additional category
	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, kidney)
	Aspiration hazard	Category 1
Environmental hazards	Aquatic acute	Category 2
	Aquatic chronic	Category 3

Hazard pictograms



Signal word : Danger

Hazard statements : Highly flammable liquid and vapor
 May be fatal if swallowed and enters airways
 Causes skin and eye irritation

Harmful if inhaled
 May cause respiratory irritation
 May cause drowsiness or dizziness
 May damage fertility or the unborn child
 May cause harm to breast-fed children
 Causes damage to organs (central nervous system)
 Causes damage to organs (central nervous system, kidney) through prolonged or repeated exposure
 Toxic to aquatic life
 Harmful to aquatic life with long lasting effects

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.
 Avoid contact during pregnancy and while nursing.
 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.
 Avoid release to the environment.
 Wear protective gloves/protective clothing/eye protection/face protection.
- Response : IF SWALLOWED: Immediately call a POISON CENTER or doctor.
 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.
 Do not induce vomiting.
 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 : Methylbenzene

Chemical name	Concentration (%)	Formula	TSCA	EC-No.	CAS RN
Toluene	min. 99.5	C6H5CH3	Listed	203-625-9	108-88-3

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. 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 powder, carbon dioxide, dry sand, foam
- Unsuitable extinguishing media : Water spray
- 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. 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 damage to the environment by flowing of spillage to rivers.

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 : As toluene has easily static electricity, earth the pipes, hoses, bottles when transporting.
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, SUS.
Do not use vinyl chloride resin, acrylic resin, polystyrene etc.

8. Exposure controls / Personal protection equipment

ACGIH TWA	20 ppm
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- 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 : -95 ° C
- Freezing point : No data available
- Boiling point : 110.6 ° C
- Flash point : 4.4 ° C (C.C.)
- Auto-ignition temperature : 536 ° C
- Decomposition temperature : No data available
- Flammability : Flammable
- Vapor pressure : 13.3 hPa (27°C)
- Relative density : No data available
- Density : 0.867 g/cm³ (20°C)
- Relative gas density : 3.2
- Solubility : Organic solvents: Miscible with many kinds of organic solvents.
Water: 0.045 % (20°C)
- Partition coefficient n- : 2.69



octanol/water (log Pow)
Explosive limits (vol %) : 1.2 - 7.1 vol %
Viscosity, kinematic: : 0.86 mm²/s (40°C)
Particle characteristics : No data available

10. Stability and reactivity

Reactivity : Oxidation with potassium dichromate or the like produces benzoic acid.
Reduction with a platinum catalyst or the like produces methylcyclohexane.

Chemical stability : Stable under normal conditions.

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

Conditions to avoid : Light, heat.

Incompatible materials : Oxidizing substances.

Hazardous decomposition products : Carbon monoxide.

11. Toxicological information

Acute toxicity (oral) : No classification
rat LD50=5000mg/kg

Acute toxicity (dermal) : No classification
rat LD50=12000mg/kg

Acute toxicity (inhalation) : No classification (gas)
Harmful if inhaled
Classification not possible (dust, mist)

Acute toxicity (vapor) - Description : rat LC50=4000ppm/4h

Skin corrosion/irritation : Causes skin irritation
In a semi-occlusive application test in which the substance 0.5mL was applied to seven rabbits for 4 hours, by 72 hours all animals exhibited erythema, ranging from very slight to severe, and slight oedema. On day 7, erythema ranged from well-defined to severe for all animals, and oedema ranged from very slight to slight for 5 animals. Thus, the substance was classified into category 2 based on evidence of moderate irritation.

Serious eye damage/irritation : Causes eye irritation
In an ocular irritation test in which the substance 0.1mL was applied to six rabbits, redness, chemosis, and discharge were observed in all six animals 1 hour after exposure, and the symptoms persisted 24, 48 hours after exposure, and then irritation decreased. Only redness was observed 72 hours after exposure, and all animals were free of ocular irritation on day 7. Thus, the substance was classified into category 2B based on evidence of mild irritation.

Respiratory sensitization : Classification not possible

Skin sensitization : No classification
No skin sensitization by maximization test with guinea pig.



Germ cell mutagenicity	<p>: No classification</p> <p>There are two negative data on dominant lethal studies in mice by oral or inhalation administration (germ cell mutagenicity tests in vivo), five negative data on chromosome aberration tests in mouse or rat bone-marrow cells by oral, inhalation or intraperitoneal administration (somatic cell mutagenicity tests in vivo), and two negative data on micronucleus examinations in mouse bone-marrow cells by oral or intraperitoneal administration (somatic cell mutagenicity tests in vivo).</p>
Carcinogenicity	<p>: No classification</p> <p>IARC classifies it as group 3(not classifiable as to its carcinogenicity to humans).</p>
Reproductive toxicity	<p>: May damage fertility or the unborn child</p> <p>May cause harm to breast-fed children</p> <p>Human epidemiological studies suggest increased incidence of natural abortion after toluene exposure, abnormal development and malformation of newborns caused by prenatal toluene abuse and decreased plasma concentrations of luteinizing hormone and testosterone after toluene exposure. Based on the description that "toluene easily crosses the placenta and is secreted into breast milk", "Additional category: Effects on and via lactation" was added.</p>
STOT-single exposure	<p>: Causes damage to organs (central nervous system)</p> <p>May cause drowsiness or dizziness</p> <p>May cause respiratory irritation</p> <p>Human studies have shown that following inhalation exposure to 750mg/m³ for 8 hours, muscle weakness, confusion, dyssynergia, and mydriasis were noted, and at 3000ppm, severe fatigue, marked nausea, and mental confusion were noted, and severe incidental exposure resulted in coma. In addition, there are many reports that the substance adversely affects central nervous system. Thus, it was classified into category 1 (central nervous system). Meanwhile, it is well known that acute exposure of humans to high concentrations of the substance easily causes anesthetic actions, and there are many cases of workers who lost consciousness due to the substance vapor. Moreover, there is animal evidence of anesthetic actions following inhalation exposure to mice or rats. Thus, it was classified into category 3 (narcois). Furthermore, human volunteers exposed to a low concentration (200ppm) developed transient, mild upper respiratory irritation. Thus, it was classified into category 3 (respiratory tract irritation).</p>
STOT-repeated exposure	<p>: Causes damage to organs (central nervous system, kidney) through prolonged or repeated exposure</p> <p>Based on the human evidence including toluene induces drug dependency, and inhalant abuse of toluene causes chronic central nervous system damage including restricted vision, headache associated with nystagmus and hearing loss, tremor, ataxia and amnesia. Futhermore renal dysfunction manifested as proteinuria and hematuria was also observed. Thus, it was classified into category 1 (central nervous system, kidney).</p>
Aspiration hazard	<p>: May be fatal if swallowed and enters airways</p> <p>Since toluene is a hydrocarbon and its dynamic viscosity is 0.86mm²/S (40 °C), it is classified into category 1.</p>



12. Ecological information

Ecotoxicity

Aquatic acute : Toxic to aquatic life
Ceriodaphnia dubia EC50=3.78mg/L/48h

Aquatic chronic : Harmful to aquatic life with long lasting effects
Ceriodaphnia dubia NOEC=0.74mg/L/7-day

Persistence and degradability

Readily biodegradable
BOD : 123%

Bioaccumulative potential

Low bioconcentration
log Pow : 2.69

Mobility in soil

Moderate mobility
Koc : 270

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) : 1294
Proper Shipping Name (IMDG) : TOLUENE
Packing group (IMDG) : II
Transport hazard class(es) (IMDG) : 3

Air transport(IATA)

UN-No. (IATA) : 1294
Proper Shipping Name (IATA) : Toluene
Packing group (IATA) : II
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 : Y
MFAG-No : 130

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) .
- 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.

