



TOKYO CHEMICAL INDUSTRY CO., LTD.

(+)-Limonene

Revision 2
number:

Revision date: 04/11/2019

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SAFETY DATA SHEET

1. IDENTIFICATION

Product name: (+)-Limonene
Product code: L0105
Company: TOKYO CHEMICAL INDUSTRY CO., LTD.
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Revision number: 2

2. HAZARDS IDENTIFICATION

Classification of the substance or mixture

PHYSICAL HAZARDS

Flammable liquids Category 3

HEALTH HAZARDS

Skin corrosion/irritation Category 2

Serious eye damage/eye irritation Category 2A

Skin sensitization Category 1

ENVIRONMENTAL HAZARDS

Acute aquatic hazard Category 1

Long-term aquatic hazard Category 1

Label elements

Pictograms or hazard symbols



Signal word

Hazard statements

Warning

Flammable liquid and vapour

Causes skin irritation

Causes serious eye irritation

May cause an allergic skin reaction

Very toxic to aquatic life

Very toxic to aquatic life with long lasting effects

Precautionary statements

[Prevention]

Keep away from heat/sparks/open flames/hot surfaces. - No smoking.

Keep container tightly closed.

Ground/bond container and receiving equipment.

Use explosion-proof electrical, ventilating and lighting equipment. Use only non-sparking tools. Take precautionary measures against static discharge.

Avoid breathing mist, vapors or spray.

Avoid release to the environment.

Contaminated work clothing should not be allowed out of the workplace.

Wash hands and face thoroughly after handling.

Wear protective gloves, eye protection.

[Response]

IF ON SKIN: Wash with plenty of soap and water. If skin irritation or rash occurs: Take off contaminated clothing. And wash it before reuse.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice or attention.

In case of fire: Use dry chemical, dry sand or foam to extinguish.

Collect spillage.

[Storage]
[Disposal]

Store in a well-ventilated place. Keep cool.

Dispose of contents and container in accordance with local, regional, national regulations.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance/mixture:	Substance
Components:	(+) -Limonene
Percent:	>99.0%(GC)
CAS RN:	5989-27-5
Synonyms:	(+) -p-Mentha-1,8-diene
Chemical Formula:	C ₁₀ H ₁₆
Notice Through Official Gazettes Reference Number	
ENCS:	(3)-2245
ISHL:	3-(4)-187, 3-(4)-222

4. FIRST-AID MEASURES

Inhalation:	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical advice/attention if you feel unwell.
Skin contact:	Remove/Take off immediately all contaminated clothing. Gently wash with plenty of soap and water. If skin irritation or rash occurs: Get medical advice/attention.
Eye contact:	Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.
Ingestion:	Get medical advice/attention if you feel unwell. Rinse mouth.
Protection of first-aiders:	A rescuer should wear personal protective equipment, such as rubber gloves and air-tight goggles.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media:	Dry chemical, foam, carbon dioxide.
Unsuitable extinguishing media:	Water (It may scatter and spread fire.)
Precautions for firefighters:	Fire-extinguishing work is done from the windward and the suitable fire-extinguishing method according to the surrounding situation is used. Uninvolved persons should evacuate to a safe place. In case of fire in the surroundings: Keep containers cool by spraying with water. Eliminate all ignition sources if safe to do so.
Special protective equipment for firefighters:	When extinguishing fire, be sure to wear personal protective equipment

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures:	Use extra personal protective equipment (self-contained breathing apparatus). Keep people away from and upwind of spill/leak. Ensure adequate ventilation. Entry to non-involved personnel should be controlled around the leakage area by roping off, etc.
Environmental precautions:	Be careful not to let it flow into rivers, etc., since adverse effects on the environment are concerned.
Methods and materials for containment and cleaning up:	Absorb spilled material in dry sand or inert absorbent before recovering it into an airtight container. In case of large amount of spillage, contain a spill by bunding. Adhered or collected material should be promptly disposed of, in accordance with appropriate laws and regulations.
Prevention of secondary hazards:	Remove all sources of ignition. Fire-extinguishing devices should be prepared in case of a fire. Use spark-proof tools and explosion-proof equipment.

7. HANDLING AND STORAGE

Precautions for safe handling

Technical measures: Handling is performed in a well ventilated place. Wear suitable protective equipment. Prevent generation of vapour or mist. Keep away from heat/sparks/open flame/hot surfaces. -No smoking. Take measures to prevent the build up of electrostatic charge. Use explosion-proof equipment. Wash hands and face thoroughly after handling.
Use a closed system if possible. Use a ventilation, local exhaust if vapour or aerosol will be generated.

Advice on safe handling: Avoid contact with skin, eyes and clothing.

Conditions for safe storage, including any incompatibilities

Storage conditions: Keep container tightly closed. Store in a cool, dark and well-ventilated place. Store under inert gas.
Store away from incompatible materials such as oxidizing agents.
Light-sensitive, Air-sensitive

Packaging material: Comply with laws.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering controls: Install a closed system or local exhaust. Also install safety shower and eye bath.

Control parameters: Not set up

Personal protective equipment

Respiratory protection: Vapor respirator. Follow local and national regulations.

Hand protection: Protective gloves.

Eye protection: Safety glasses. A face-shield, if the situation requires.

Skin and body protection: Protective clothing. Protective boots, if the situation requires.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state (20°C): Liquid
Form: Clear
Colour: Colorless - Almost colorless
Odour: Lemon-like
pH: No data available
Melting point/freezing point: -75°C
Boiling point/range: 176°C
Flash point: 51°C
Flammability or explosive limits:
Lower: 0.7%
Upper: 6.1%
Vapour pressure: 0.4kPa/14°C
Vapour density: 4.7
Relative density: 0.84
Solubility(ies):
[Water] Insoluble (13.8mg/L, 25°C)
[Other solvents]
Miscible: Ether, Alcohols
Slightly soluble: Glycerol
Insoluble: Propylene glycol
Log Pow: 4.2

10. STABILITY AND REACTIVITY

Reactivity: No data available
Chemical stability: Stable under proper conditions.
Possibility of hazardous reactions: No special reactivity has been reported.
Conditions to avoid: Spark, Open flame, Static discharge
Incompatible materials: Oxidizing agents
Hazardous decomposition products: Carbon dioxide, Carbon monoxide

11. TOXICOLOGICAL INFORMATION

Acute Toxicity:	ivn-rat LD50:110 mg/kg orl-rat LD50:4400 mg/kg skn-rbt LD50:>5 g/kg ipr-rat LD50:110 mg/kg
Skin corrosion/irritation:	skn-rbt 10 %/24H MLD
Serious eye damage/irritation:	No data available
Germ cell mutagenicity:	mtr-mus-fbr:0.005 pph/24D(-S9) cyt-rat-orl:0.5 ppb
Carcinogenicity:	orl-rat TDLo:38625 mg/kg/2Y-C
IARC =	Group 3 (Not classifiable as carcinogenic to humans)
NTP =	No data available
Reproductive toxicity:	orl-mus TDLo:14178 mg/kg (7-12D preg)
RTECS Number:	GW6360000

12. ECOLOGICAL INFORMATION

Ecotoxicity:	
Fish:	No data available
Crustacea:	No data available
Algae:	No data available
Persistence / degradability:	No data available *The substance was determined as "Ready biodegradability" under the Chemical Substances Control Law.
Bioaccumulative potential(BCF):	No data available
Mobility in soil	
Log Pow:	4.2
Soil adsorption (Koc):	4780
Henry's Law (PaM³/mol):	3.8 x 10 ⁴
Other adverse effects:	No data available

13. DISPOSAL CONSIDERATIONS

Recycle to process, if possible. Consult your local regional authorities. You may be able to burn in a chemical incinerator equipped with an afterburner and scrubber system. Observe all federal, state and local regulations when disposing of the substance.

14. TRANSPORT INFORMATION

Hazards Class:	3: Flammable liquid.
UN-No:	2319
Proper shipping name:	Terpene hydrocarbons, n.o.s.
Packing group:	III
Marine pollutant	Y
Specific precautionary transport measures and conditions:	

15. JAPANESE REGULATORY INFORMATION

Fire Defense Law:	Class-4 No.2 petroleum	Dangerous grade 3	Not water-soluble fluid
ISHL(Enforcement Order of the Industrial Safety and Health Act Appended Table 1):	Inflammable Substances		
Law for safety of vessels:	Hazardous materials notification, Schedule form No.1 Flammable liquid		

16. OTHER INFORMATION**The reference company name of written contents**

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This SDS was prepared sincerely on the basis of the information we could obtained, however, any warranty shall not be given regarding the data contained and the assessment of hazards and toxicity. Prior to use, please investigate not only the hazards and toxicity information but also the laws and regulations of the organization, area and country where the products are to be used, which shall be given the first priority. The products are supposed to be used promptly after purchase in consideration of safety. Some new information or amendments may be added afterwards. If the products are to be used far behind the expected time of use or you have any questions, please feel free to contact us. The stated cautions are for normal handling only. In case of special handling, sufficient care should be taken, in addition to the safety measures suitable for the situation. All chemical products should be treated with the recognition of "having unknown hazards and toxicity", which differ greatly depending on the conditions and handling when in use and/or the conditions and duration of storage. The products must be handled only by those who are familiar with specialized knowledge and have experience or under the guidance of those specialists throughout use from opening to storage and disposal. Safe usage conditions shall be set up on each user's own responsibility.