

1: Identification of substance / mixture

1. Product Identifier

Substance

Product Name **(+/-)-Limonene**
Product Code 046838
CAS Number 138-86-3
Other Names Dipentene
(±)-p-Mentha-1,8-diene
IUPAC
MFCN Number MFCD00062992
EC/EINECS 205-341-0
REACH Number 01-2120766421-57-0000 Index-No 601-029-00-7

2. Relevant identified uses of the substance or mixture and uses advised against

Research and Development

3. Details of the supplier of the safety data sheet

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Hadfield
Derbyshire
SK13 1QH
UK

Telephone: +44(0)1457 860111
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Email: sds@fluorochem.co.uk



4. Emergency telephone number

+44(0)7855 268577 -

2. Hazards Identification

1. Classification of the substance or mixture

H226	Flam. Liq. 3	
H315	Skin Irrit. 2	
H317	Skin Sens. 1	
H410	Aquatic Chronic 1	

2. Label elements

Signal Word **Warning**



Hazard Statements

H226	Flammable liquid and vapour.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H410	Very toxic to aquatic life with long lasting effects.

Precautionary Phrases

P233	Keep container tightly closed.
P273	Avoid release to the environment.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P303 + P361 + P353	IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P370 + P378	In case of fire: Use sand, CO2 or extinguishing powder for extinction.
P391	Collect spillage.

3. Other Hazards

Additional precautionary phrases are located throughout the safety data sheet

3. Composition / Information on Ingredients

1. Substances

Product Name	Hazards	Concentration
(+/-)-Limonene		
CAS Number: 138-86-3 EC/EINECS: 205-341-0 : 01-2120766421-57-0000	H226, H315, H317, H410 Aquatic Chronic 1, Flam. Liq. 3, Skin Irrit. 2, Skin Sens. 1	<=100%

4. First Aid Measures

1. Description of first aid measures

<i>Skin Contact</i>	P303 + P361 + P353: IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. P332 + P313: If skin irritation occurs: Get medical advice/attention. Wash immediately with plenty of soap and water.
<i>Eye Contact</i>	Rinse opened eye for several minutes under running water.
<i>Ingestion</i>	Wash out mouth with water.
<i>Inhalation</i>	Remove casualty from exposure ensuring one's own safety whilst doing so.

2. Most important symptoms and effects

There may be irritation and redness.

3. Indication of any immediate medical attention

No additional measures required

5. Firefighting measures

1. Extinguishing Media

<i>Suitable</i>	P370 + P378: In case of fire: Use sand, CO2 or extinguishing powder for extinction. no data
<i>Unsuitable</i>	no data

2. Special Hazards arising from the substance or mixture

In combustion toxic fumes may form.

3. Advice for Fire Fighters

Wear self-contained breathing apparatus.
Wear protective clothing to prevent contact with skin and eyes.

6. Accidental Release Measures

1. Personal Precautions

Eliminate all sources of ignition.
Do not attempt to take action without suitable protective clothing – see section 8 of SDS.

2. Environmental Precautions

Do not discharge into drains or rivers.
Contain the spillage using bunding.

3. Methods & Materials

P391: Collect spillage.
Mix with sand or vermiculite.
Transfer to a closable, labelled salvage container for disposal by an appropriate method.

4. Preventing the occurrence of secondary hazards.

No Special Measures Required

7. Handling and Storage

1. Personal Precautions

<i>Safe Handling</i>	Ensure there is sufficient ventilation of the area. P240: Ground/bond container and receiving equipment. P264: Wash hands thoroughly after handling. P273: Avoid release to the environment.
<i>Protection against explosions and fires</i>	P241: Use explosion-proof electrical/ventilating/lighting/. equipment. P242: Use only non-sparking tools. P243: Take precautionary measures against static discharge. P362: Take off contaminated clothing and wash before reuse. Normal measures for preventive fire protection.

2. Conditions for safe storage, including any incompatibilities

<i>Managing Storage Risks</i>	Store in cool, well ventilated area. Keep away from sources of ignition. Keep container tightly closed. Keep away from direct sunlight.
<i>Storage Controls</i>	No special requirements
<i>Maintaining Integrity</i>	P210: Keep away from heat/sparks/open flames/hot surfaces. – No smoking. P233: Keep container tightly closed. Store away from oxidising agents
<i>Other advice</i>	No further information available.

3. Specific End Uses

The end use(s) have not been fully determined. The substance is supplied for Research and Development purposes by professionals only.

8. Exposure Controls/Personal Protection

1. Control Parameters

No Data Available

2. Exposure Controls

<i>General protective and hygiene measures</i>	P280: Wear protective gloves/protective clothing/eye protection/face protection. Wash hands during breaks and at the end of handling the material Immediately remove any contaminated clothing
<i>Engineering measures</i>	Ensure there is sufficient ventilation of the area.
<i>Eye / Face Protection</i>	Safety Glasses with side-shields.
<i>Hand protection</i>	Protective gloves.
<i>Respiratory protection</i>	Use breathing protection with high concentrations
<i>Skin protection</i>	Handle with gloves. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practice. Wash and dry hands. Protective clothing.
<i>Other personal protection advice</i>	no data

9. Physical and Chemical Properties

1. Physical and Chemical Properties

Appearance	Clear colourless to very pale yellow liquid
Odour	Lemon-like
Odour threshold	No Data Available
PH	No Data Available
Melting point / Freezing point	-96°C
Initial boiling point and boiling range	178°C
Flash point	45°C
Evaporation rate	No Data Available
Flammability(solid,gas)	No Data Available
Upper/lower flammability or explosive limits	Upper: 6.1% Lower: 0.7%
Vapour pressure	2.7kPa/68°C
Vapour density	4.7
Relative density	0.85
Solubility(ies):	Miscible: Ether. Alcohols. Insoluble Water (1.8mg/
Partition coefficient: n-octanol/water	4.23
Auto-ignition temperature	237°C
Decomposition temperature	No Data Available
Viscosity	No Data Available
Explosive properties	No Data Available
Oxidising properties	No Data Available

2. Other Information

No additional information available

10. Stability and Reactivity

1. Reactivity

no unusual reactivity

2. Stability

Stable under normal conditions.

3. Possibility of Hazardous Reactions

no hazardous reactions known

4. Conditions to Avoid

Air sensitive.
Spark, Open flame, Static discharge

5. Incompatible Materials

Oxidising agents.
Bases.

6. Hazardous Decomposition Products

In combustion emits toxic fumes.
In combustion emits toxic fumes of carbon dioxide / carbon monoxide.

11. Toxicology information

1. Information

<i>Acute Toxicity</i>	ivn-mus LD50:1010 uL/kg orl-rat LD50:5300 mg/kg ihl-mus LC50:67500 mg/m3
<i>Skin corrosion/irritation</i>	irritant for skin and mucous membranes skn-rbt 500 mg/24H MOD
<i>Serious eye Damage/irritation</i>	irritant effect
<i>Respiratory or skin sensitisation</i>	No sensitizing effect known
<i>Germ Cell mutagenicity</i>	

	not known
<i>Carcinogenicity</i>	not known
<i>Reproductive toxicity</i>	not known
<i>STOT-single exposure</i>	not known
<i>STOT-repeated exposure</i>	not known
<i>Aspiration hazard</i>	not known

2. Additional

To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.
No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH

12. Ecological Information

1. Toxicity

Fish: 96h LC50:1.1 mg/L (Oryzias latipes)
Crustacea: 48h EC50:0.70 mg/L (Daphnia magna)
Algae: 72h EC50:>21 mg/L (Selenastrum capricornutum)

2. Persistence and degradability

41 - 98 % (by BOD), 50 - 81 % (by TOC), 100 % (by GC)

3. Bio-Accumulative Potential

262

4. Mobility and Soil

Log Pow: 4.23
Henry's Law constant(PaM3/mol): 38.5 x 10³

5. Results of PBT & vPvB assessment

not known

6. Other adverse effects

Do not allow product to reach ground water, water bodies or sewage system, even in small quantities.

13. Disposal Considerations

1. Waste Treatment Methods

Disposal Operations

Disposal of Packaging Disposal must be made according to official regulations.

14. Transport Information

Air (ICAO)

1. **UN Number:** 2052
2. **Shipping Name:** Dipentene
3. **Transport hazard class(es):** : 3 **Sub Class :**



4. **Packing group:** III
5. **Environmental hazards:**
6. **Special Precautions for user:**
7. **Transport in bulk:**

Road (ADR)

1. **UN Number:** 2052

2. **Shipping Name:** DIPENTENE
3. **Transport hazard class(es):** : 3 Sub Class :



4. **Packing group:** III
5. **Environmental hazards:**
6. **Special Precautions for user:**
7. **Transport in bulk:**

Sea (IMDG)

1. **UN Number:** 2052
2. **Shipping Name:** Dipentene
3. **Transport hazard class(es):** : 3 Sub Class :



4. **Packing group:** III
5. **Environmental hazards:** Marine Pollutant: 1
6. **Special Precautions for user:**
7. **Transport in bulk:** IBCINS: IBC03
IBCPPROV: -
UNTANKINS: -
TANKPROV: TP1

15. Safety, health, environmental and national regulations

1. Safety, health, environmental and national regulations:

product is not subject to any additional regulations or provisions

2. Safety Assessment

No Chemical Safety Assessment

16. Other Information

1. Other Information:

ADR: Accord Europeen sur le transport des marchandises Dangereuses par Route(European Agreement concerning the International Carriage of Dangerous Goods by road)
RID:Reglement International concernant le transport des marchandises dangereuses par chemin de fer (Regulations concerning the International transport of Dangerous Goods by Rail)
IMDG: International Maritime Code for Dangerous Goods
IATA: International Air Transport Association
IATA-DGR: Dangerous Goods Regulations by the International Air Transport Association
ICAO:International Civil Aviation Organization
ICAO-TI: Technical Instructions by the ICAO
GHS: Globally Harmonized System of Classification and Labelling of Chemicals
CAS:Chemical Abstracts Service

2. Associated risk phrases according to European directive 67/548/EEC

3. Disclaimer

The product listed is for research and development purposes only and not for human or animal use. As such, in most cases, the toxicological, ecological and physicochemical properties have not been fully determined and the product should be treated with respect and always handled under suitable conditions by appropriately qualified personnel. The responsible party shall use this datasheet only in conjunction with other sources of information gathered by them, and should make an independent judgement of suitability, to ensure proper use and protect the health and safety of employees. This information is furnished without warranty and any use of the product not in conformance with this material safety data sheet, or in combination with any other product or process, is the responsibility of the user.