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MATERIAL SAFETY DATA SHEET OF DICYCLOPENTADIENE

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY/UNDERTAKING

PRODUCT NAME: Dicyclopentadiene (DCPD)
Company: HENGHE MATERIALS&SCIENCE TECHNOLOGY CO., LTD
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Product code: HH-15640
Release date : 10/8/2018

2. COMPOSITION/INFORMATION ON INGREDIENTS

Substance/preparation: Substance
Component(s): Dicyclopentadiene
Percent: $\geq 85\%$
CAS Number : 77-73-6
Synonyms: 3a,4,7,7a-Tetrahydro-4,7-methano-1H-indene,
Tricyclo[5.2.1.0^(2,6)]deca-3,8-diene
Chemical Formula: C₁₀H₁₂
ENCS: (3)-1010,(4)-634
ISHL: Official announcement chemistry substance.

3. HAZARDS IDENTIFICATION

Most important hazards

Properties affecting health: Harmful by inhalation and if swallowed. Irritating to eyes, respiratory system and skin.

Environmental properties: Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Physico-chemical properties: Highly flammable. May ignite by heat, sparks, and flame.
Specific hazards: No information available.
Name of Classification : Flammable liquid

4. FIRST AID MEASURES

Inhalation: Keep warm and in a quiet place. Call a physician immediately. Oxygen or artificial respiration if needed. If unconscious and vomiting, lay victim with head to one side to enable breathing.

Skin contact: Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. If the appearance of the exposed skin has changed or pain persists, medical treatment should be arranged.

Eye contact: Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Call a physician immediately.

Ingestion: Rinse mouth. Call a physician immediately.

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: water mist, extinguishing powder, alcohol-resistant foam, carbon dioxide, sand.

Extinguishing media which must not be used for safety reasons: water spray , water jet

Specific methods: Do not allow extinguishing water to enter sewerage, the soil or inshore waters.

Special protective equipment for firefighters: When extinguishing fire, be sure to wear personal protective equipment.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions: Use personal protective equipment. 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. Fire-extinguishing devices should be prepared in case of a fire.

Environmental precautions: Be careful not to let it flow into rivers, etc., since adverse effects on the environment are concerned.

Methods for cleaning up: Sweep dust to collect it into an air-tight vessel, taking care not to disperse it. In the case of liquid, absorb it with dry sand, earth, sawdust, rags, etc. before recovering it into an airtight container. In case of large amount of outflow, prevent it by spreading earth on the ground. Adhered or collected material, etc. 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

Technical measures:

Handling is performed in a well ventilated place.
Wear suitable protective equipment.
Handle with care to avoid dust dispersion.
Use of high temperature materials, sparks, and fire is forbidden in proximity.
Take measures to prevent the build up of electrostatic charge. Use explosion-proof equipment. Wash hands and face before breaks and immediately after handling the product.

Precautions:

Handle in a local exhaust unit to prevent dust and aerosol from being generated.

Advice on safe handling:

Avoid contact with skin, eyes and clothing.

Storage conditions:

Use of fire is strictly prohibited.
Seal the container air-tight and store it in a cool dark place. Keep it away from fire sources, such as fire or heat source. Store away from oxidizing agents.

Packaging material:

Law is followed.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering measures to reduce exposure:

Install an airtight equipment or a local exhaust unit so that workers should not be exposed directly.
Also install an equipment for washing eyes and body near the place is handled.

Control parameters:

Not set up.

Exposure limits:

Not set up.
(ACGIH TLV:TWA 5ppm according Japanese Standard)

Personal protective equipment

Respiratory protection:	If concentration is above the limit, A gas mask (full cover) is needed, if it is emergent, an SCBA should be worn.
Hand protection:	Protective gloves.
Eye protection:	Safety glasses. A face-shield, if the situation requires.
Skin and body protection:	Protective clothing. An apron, boots, etc. according to the situation.
Special instructions for protection and hygiene:	After handling, wash hands and gargle well.

9. PHYSICAL AND CHEMICAL PROPERTIES:

Physical State	(20 °C):
Appearance and Characters:	Colorless or light yellow liquid, if percent is high, should be crystal lumps.
Odor:	Camphor-like
pH:	No data available.
Information on changes in the physical state	
Boiling Point/Range:	167 °C
Melting Point:	32 °C (Freezing point)
Flash Point:	44°C
Autoignition Temperature:	503°C
Explosive properties	
Explosive Lower:	0.8%
Explosive Upper:	6.3%
Vapor Pressure:	0.2kPa/20° C
Vapor Density:	4.55
Density:	0.93
Solubility:	Soluble in : Alcohol Ether Toluene Acetone Acetic acid Ethyl acetate Dichloromethane n-Hexane Insoluble in: Water (40mg/L)
log Pow =	2.89
Main usage:	Dicyclopentadiene(DCPD) is very active. It can be used to make DCPD Resin, Unsaturated polyester, Ethylene Propylene Diene Monomer(EPDM), Ethylidene Norbornene(ENB), Ferrocene, Adamantane, Rocket fuel, Pesticide, etc.

10. STABILITY AND REACTIVITY

Stability:	It is very flammable and combustible. The steam is liable to move along the earth or floor, causing fire at distant places. It may form an explosive peroxide on exposure to air. Depolymerize on heating.
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Reactivity: No special reactivity has been reported.
Materials to avoid: oxidizing agents, strong acids, strong bases
Hazardous Decomposition Carbon monoxide, Carbon dioxide
Products:

11. TOXICOLOGICAL INFORMATION

Acute toxicity: It may cause effects on the central nervous system.
Acute toxicity data is reported.
ihl-hmn TClO:16 mg/m³
orl-rat LD50:353 mg/kg
ihl-rat LC50:660 ppm/4H
skn-rbt LD50:5080 mg/kg

Local effects: Data of stimulation against the skin and eye have been reported. skn-rbt:20 mg/24H MOD

Chronic toxicity / Long term toxicity: Blood Lungs Liver Kidney may be affected by repeated or prolonged exposure.

Reproductive toxicity: Data on reproductive toxicity have been reported.
orl-rat TDLo:22400 mg/kg (multigeneration)

12. ECOLOGICAL INFORMATION

Mobility: No information available.

Persistence / degradability: According to the results of tests of biodegradability this product is not readily biodegradable
Degree of degradation:0 % (by BOD), 0 % (by GC)

Bioaccumulation: Chemical substance considered to be less concentrative within bodies of fish and shellfish.
(Published by Ministry of Economy, Trade and Industry) BCF:112 ~ 330 (conc. 0.3 ppm), 58.9 ~ 384 (conc. 0.03 ppm)

Ecotoxicity: The data of ecotoxicity examination is reported.
Fish 48h LC50:3.7 ppm (Oryzias latipes)

Other information: Partition coefficient (n-octanol/water):2.89
Henry's Law constant:1083.9 PaM₃/mol
Soil adsorption (Koc):894

13. DISPOSAL CONSIDERATIONS

Wear appropriate personal protective clothing.
In accordance with local and national regulations If the substance is burned for disposal, it should be burned in a furnace equipped with an after-burner and a scrubber.
Empty the contents throughly before disposing of a container. If the substance is difficult to be disposed of, (e.g. by reason that there is no waste disposal facility), it should be committed to

an authorized industrial waste processing agent.

14. TRANSPORT INFORMATION

Dangerous Goods Number:	33517
Hazards Class / Package Mark:	3: Flammable liquid.
UN-No:	2048
Proper shipping name:	Dicyclopentadiene
Packing group:	III

Specific precautionary transport measures and conditions:	When transporting the product, confirm that there is no leakage from the vessel. Then, load it securely with collapse prevention lest it should tumble, fall, or be damaged. Take actions in accordance with the Fire Service Law, etc.
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This MSDS 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. 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.