

**CHINA PETROCHEMICAL DEVELOPMENT CORP.**

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**Material Safety Data Sheet**

**CYCLOHEXANE**

**1. Product Identification**

**Synonyms:** Hexahydrobenzene; hexamethylene; Hexanaphthene; Beneze Hexahydride

**CAS No.:** 110-82-7

**Molecular Weight:** 84.16

**Chemical Formula:** C<sub>6</sub>H<sub>12</sub>

**2. Composition/Information on Ingredients**

Ingredient	CAS No	Percent	Hazardous
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Cyclohexane	110-82-7	90 - 100%	Yes

**3. Hazards Identification**

**Emergency Overview**

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**DANGER! EXTREMELY FLAMMABLE LIQUID AND VAPOR. VAPOR MAY CAUSE FLASH FIRE. HARMFUL OR FATAL IF SWALLOWED. HARMFUL IF INHALED. AFFECTS CENTRAL NERVOUS SYSTEM. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT.**

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Health Rating: 2 - Moderate  
Flammability Rating: 4 - Extreme (Flammable)  
Reactivity Rating: 0 - None  
Contact Rating: 1 - Slight  
CLASS B EXTINGUISHER  
Storage Color Code: Red (Flammable)

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### **Potential Health Effects**

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#### **Inhalation:**

Causes irritation to the respiratory tract. Symptoms may include coughing, shortness of breath. High concentrations have a narcotic effect.

#### **Ingestion:**

May produce abdominal pain, nausea. Aspiration into lungs can produce severe lung damage and is a medical emergency. Other symptoms expected to parallel inhalation.

#### **Skin Contact:**

Causes irritation to skin. Symptoms include redness, itching, and pain.

#### **Eye Contact:**

Causes irritation, redness, and pain.

#### **Chronic Exposure:**

Chronic exposure may cause skin effects.

#### **Aggravation of Pre-existing Conditions:**

Persons with pre-existing skin disorders or eye problems, or impaired liver, kidney or respiratory function may be more susceptible to the effects of the substance.

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## 4. First Aid Measures

#### **Inhalation:**

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

#### **Ingestion:**

Aspiration hazard. If swallowed, vomiting may occur spontaneously, but DO NOT INDUCE. If vomiting occurs, keep head below hips to prevent aspiration into lungs. Never give anything by mouth to an unconscious person. Call a physician immediately.

#### **Skin Contact:**

In case of contact, immediately flush skin with plenty of soap and water for at least 15

minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. Call a physician.

**Eye Contact:**

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

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## 5. Fire Fighting Measures

**Fire:**

Flash point: -18C (0F) CC

Autoignition temperature: 245°C (473F)

Flammable limits in air % by volume:

lcl: 1.3; ucl: 8.0

Extremely Flammable.

**Explosion:**

Above flash point, vapor-air mixtures are explosive within flammable limits noted above. Vapors can flow along surfaces to distant ignition source and flash back. Sealed containers may rupture when heated. Contact with strong oxidizers may cause fire. Sensitive to static discharge.

**Fire Extinguishing Media:**

Dry chemical, foam or carbon dioxide. Water may be ineffective. Water spray may be used to keep fire exposed containers cool, dilute spills to nonflammable mixtures, protect personnel attempting to stop leak and disperse vapors.

**Special Information:**

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. This highly flammable liquid must be kept from sparks, open flame, hot surfaces, and all sources of heat and ignition.

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## 6. Accidental Release Measures

Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! If a

leak or spill has not ignited, use water spray to disperse the vapors, to protect personnel attempting to stop leak, and to flush spills away from exposures.

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## 7. Handling and Storage

Protect against physical damage. Store in a cool, dry well-ventilated location, away from any area where the fire hazard may be acute. Outside or detached storage is preferred. Separate from incompatibles. Containers should be bonded and grounded for transfers to avoid static sparks. Storage and use areas should be No Smoking areas. Use non-sparking type tools and equipment, including explosion proof ventilation. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

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## 8. Exposure Controls/Personal Protection

### **Airborne Exposure Limits:**

-OSHA Permissible Exposure Limit (PEL): 300 ppm (TWA)

-OSHA Shortterm Exposure Limit (SEL): 375 ppm (TWA)

### **Ventilation System:**

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

### **Personal Respirators (NIOSH Approved):**

If the exposure limit is exceeded and engineering controls are not feasible, a full facepiece respirator with organic vapor cartridge may be worn up to 50 times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator.

WARNING: Air purifying respirators do not protect workers in oxygen-deficient atmospheres.

### **Skin Protection:**

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

### **Eye Protection:**

Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

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## 9. Physical and Chemical Properties

**Appearance:**

Clear, colorless liquid.

**Odor:**

Characteristic odor. Faint ether-like odor.

**Solubility:**

Insoluble in water.

**Specific Gravity:**

0.78 @ 20°C/4°C

**pH:**

No information found.

**% Volatiles by volume @ 21C (70F):**

100

**Boiling Point:**

81°C (178F)

**Melting Point:**

7°C (45F)

**Vapor Density (Air=1):**

2.9

**Vapor Pressure (mm Hg):**

77 @ 20°C (68F)

**Evaporation Rate (BuAc=1):**

2.6 (Ether = 1)

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## 10. Stability and Reactivity

**Stability:**

Stable at room temperature in sealed containers.

**Hazardous Decomposition Products:**

Carbon dioxide and carbon monoxide may form when heated to decomposition.

**Hazardous Polymerization:**

Will not occur.

**Incompatibilities:**

Strong oxidizers, heat and sources of ignition.

**Conditions to Avoid:**

Incompatibles.

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## 11. Toxicological Information

Oral rat LD50 8~39mg/kg. Investigated as a mutagen.

Ingredient	---NTP Carcinogen---		IARC Category
	Known	Anticipated	
Cyclohexane (110-82-7)	No	No	None

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## 12. Ecological Information

**Environmental Fate:**

When released into the soil, this material may biodegrade to a moderate extent. When released into the soil, this material is expected to leach into groundwater. When released into the soil, this material is expected to quickly evaporate. When released to water, this material is expected to quickly evaporate. This material has a log octanol-water partition coefficient of greater than 3.0. This material may bioaccumulate to some extent. When released into the air, this material is expected to be readily degraded by reaction with photochemically produced hydroxyl radicals. When released into the air, this material is expected to have a half-life between 1 and 10 days.

**Environmental Toxicity:**

This material is expected to be slightly toxic to aquatic life. The LC50/96-hour values for fish are between 10 and 100 mg/l.

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## 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a EPA approved incinerator or disposed in a EPA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations.

Dispose of container and unused contents in accordance with federal, state and local requirements.

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## 14. Transport Information

### Domestic (Land, D.O.T.)

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**Proper Shipping Name:** CYCLOHEXANE  
**Hazard Class:** 3  
**UN/NA:** UN1145  
**Packing Group:** II  
**Information reported for product/size:** 52L

### International (Water, I.M.O.)

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**Proper Shipping Name:** CYCLOHEXANE  
**Hazard Class:** 3  
**UN/NA:** UN1145  
**Packing Group:** II  
**Information reported for product/size:** 52L

### International (Air, I.C.A.O.)

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**Proper Shipping Name:** CYCLOHEXANE  
**Hazard Class:** 3  
**UN/NA:** UN1145  
**Packing Group:** II  
**Information reported for product/size:** 52L

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## 15. Regulatory Information

-----\Chemical Inventory Status - Part 1\-----

Ingredient	TSCA	EC	Japan	Australia
Cyclohexane (110-82-7)	Yes	Yes	Yes	Yes

-----\Chemical Inventory Status - Part 2\-----

Ingredient	--Canada--			
	Korea	DSL	NDSL	Phil.
Cyclohexane (110-82-7)	Yes	Yes	No	Yes

Ingredient	-----\Federal, State & International Regulations - Part 1\-----			
	-SARA 302- RQ	TPQ	List	-SARA 313- Chemical Catg.
Cyclohexane (110-82-7)	No	No	Yes	No

Ingredient	-----\Federal, State & International Regulations - Part 2\-----		
	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Cyclohexane (110-82-7)	1000	U056	No

Chemical Weapons Convention: No    TSCA 12(b): Yes    CDTA: Yes  
 SARA 311/312: Acute: Yes    Chronic: Yes    Fire: Yes    Pressure: No  
 Reactivity: No    (Pure / Liquid)

**Australian Hazchem Code:** 3[Y]E

**Poison Schedule:** None allocated.

**WHMIS:**

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

## 16. Other Information

**NFPA Ratings:** Health: **3** Flammability: **3** Reactivity: **0**

**Label Hazard Warning:**

DANGER! EXTREMELY FLAMMABLE LIQUID AND VAPOR. VAPOR MAY CAUSE FLASH FIRE. HARMFUL OR FATAL IF SWALLOWED. HARMFUL IF INHALED. AFFECTS CENTRAL NERVOUS SYSTEM. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT.

**Label Precautions:**

Keep away from heat, sparks and flame.

Avoid contact with eyes, skin and clothing.

Avoid breathing vapor.

Keep container closed.

Use only with adequate ventilation.

Wash thoroughly after handling.

**Label First Aid:**

Aspiration hazard. If swallowed, Do Not induce vomiting. Give water to rinse mouth.

Never give anything by mouth to an unconscious person. If vomiting occurs, keep head below hips to prevent aspiration into lungs. Call a physician immediately. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. In all cases, get medical attention.

**Disclaimer:**

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