

Cyclohexane

Division	CYH100
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1. IDENTIFICATION

A. Product name:

Cyclohexane

B. Recommended use of the chemical and restrictions on use:

- General use : Solvent for industrial
- Restriction on use : Not available

C. Information of manufacturer, supplier:

Company:

SK global chemical co., LTD

Address:

Head office) 99, Seorin-dong, Jongno-gu, Seoul, Korea9,
Factory) 110, Gosa-dong, Nam-gu, Ulsan, Korea,
Laboratory)140-1, Wonchon-dong, Yuseong-gu, Daejeon, Korea

Emergency Telephone No:

+82-2-2121-6823, +82-52-208-3357, +82-42-609-8442

2. HAZARD IDENTIFICATION

A. Classification:

Flammable liquids : 2
Skin corrosion/irritation : 2
Specific target organ toxicity(single exposure) : 3
Aspiration hazard : 1
Hazardous to the Aquatic Environment-Acute hazard : 1

B. Label element, including precautionary statements:

Symbols:

Signal word(s):

Danger

Hazard statement(s):

- H225: Highly flammable liquid and vapour
- H304: May be fatal if swallowed and enters airways
- H315: Causes skin irritation
- H336: May cause drowsiness and dizziness
- H400: Very toxic to aquatic life

○ **Precautionary statement(s):**

◎ Prevention

- P210: Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
- P233: Keep container tightly closed.
- P240: Ground/bond container and receiving equipment.
- P241: Use explosion-proof electrical/ventilating/lighting/.../equipment.
- P242: Use only non-sparking tools.
- P243: Take precautionary measures against static discharge.
- P261: Avoid breathing dust/fume/gas/mist/vapours/spray.
- P264: Wash ... thoroughly after handling.
- P271: Use only outdoors or in a well-ventilated area.
- P273: Avoid release to the environment.
- P280: Wear protective gloves/protective clothing/eye protection/face protection.

◎ Response

- P301+P310: IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
- P302+P352: IF ON SKIN: Wash with plenty of soap and water.
- P303+P361+P353: IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
- P304+P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
- P312: Call a POISON CENTER or doctor/physician if you feel unwell.
- P321: Specific treatment (see ... on this label).
- P331: Do NOT induce vomiting.
- P332+P313: If skin irritation occurs: Get medical advice/attention.
- P362: Take off contaminated clothing and wash before reuse.
- P370+P378: In case of fire: Use ... for extinction.
- P391: Collect spillage.

◎ Storage

- P403+P233: Store in a well-ventilated place. Keep container tightly closed.
- P403+P235: Store in a well-ventilated place. Keep cool.
- P405: Store locked up.

◎ Disposal

- P501: Dispose of contents/container to (in accordance with local/regional/national/international regulation).

C. Other hazards which do not result in classification;

○ NFPA grade (0 ~ 4 level)

- Health : 1 , Flammability : 3, Reactivity : 0

D. Classification of the substance or mixture

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical identity	Common name,synonym	CAS number	Percentages(%)
Hexahydrobenzene	Hexahydrobenzene	110-82-7	100

The Others

4. FIRST AID MEASURES

A. Eye contact:

- Do not rub your eyes.
- Immediately flush eyes with plenty of water for at least 15minutes and call a doctor/physician.
- Get medical attention immediately.

B. Skin contact:

- Flush skin with plenty of wter for at least 15 minutes while removing contaminated clothing and shoes.
- Laundering enough contaminated clothing before reuse.
- Get medical attention immediately.
- Go to the hospital immediately if symptoms(flare, irritate) occur.
- Wash thoroughly after handling.

C. Inhalation:

- When exposed to large amounts of steam and mist, move to fresh air.
- Take specific treatment if needed.
- Get medical attention immediately.

D. Ingestion:

- About whether I should induce vomiting Take the advice of a doctor.
- Rinse your mouth with water immediately.
- Get medical attention immediately.
- If swallowed, large amounts of water to drink and do not induce vomiting.

E. Most important symptoms/effect, acute and delayed:

- Not available

F. Indication of immediate medical attention and special treatment needed, if necessary:

- Notify medical personnel of contaminated situations and have them take appropriate protective measures.

5. FIRE-FIGHTING MEASURES**A. Suitable extinguishing media:**

- Dry chemical, carbon dioxide, regular foam extinguishing agent, spray
- Avoid use of water jet for extinguishing

B. Specific hazards arising from the chemical:

- Not available

C. Special protective equipment and precautions for firefighters:

- Cool containers with water until well after fire is out.
- Keep unauthorized personnel out.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- Use appropriate extinguishing measure suitable for surrounding fire.
- Keep containers cool with water spray.
- Vapor or gas is burned at distant ignition sources can be spread quickly.
- Due to the extremely low flash point, irrigating fire extinguishing may be less effective when put out a fire.

6. ACCIDENTAL RELEASE MEASURES**A. Personal precautions, protective equipment and emergency procedures:**

- Do not touch spilled material. Stop leak if you can do it without risk.
- Remove all sources of ignition.
- Handling the damaged containers or spilled material after wearing protective equipment.
- Do not direct water at spill or source of leak.
- Avoid skin contact and inhalation.
- Cleanup and disposal under expert supervision is advised.

B. Environmental precautions:

- Prevent runoff and contact with waterways, drains or sewers.

- If large amounts have been spilled, inform the relevant authorities.

C. Methods and materials for containment and cleaning up:

- Large spill : Stay upwind and keep out of low areas. Dike for later disposal.
- Notification to central government, local government. When emissions at least of the standard amount
- Dispose of waste in accordance with local regulation.
- Appropriate container for disposal of spilled material collected.
- Small leak: sand or other non-combustible material, please let use absorption.
- Wipe off the solvent.
- Dike for later disposal.
- Avoid entering to sewers or water system.
- Do not use plastic containers.
- Prevent the influx to waterways, sewers, basements or confined spaces.

7. HANDLING AND STORAGE

A. Precautions for safe handling:

- Comply with all applicable laws and regulations for handling
- Get the manual before use.
- Refer to Engineering controls and personal protective equipment.
- Operators should wear antistatic footwear and clothing.
- Do not inhale the steam prolonged or repeated.
- Avoid contact with heat, sparks, flame or other ignition sources.

B. Conditions for safe storage. including incompatibilities:

- Do not use damaged containers.
- Keep in the original container.
- Please pay attention to incompatibilities materials and conditions to avoid.
- No open fire.
- Prevent static electricity and keep away from combustible materials or heat sources.

- Collected them in sealed containers.
- Store away from water and sewer.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

A. Exposure limits in the air of the workplace, biological limit values:

- ACGIH
TLV
- [Hexahydrobenzene] : TWA, 100 ppm (350 mg/m³)
- OSHA PEL
- [Hexahydrobenzene]:300ppm 1050mg/m³

B. Appropriate engineering controls:

- A system of local and/or general exhaust is recommended to keep employee exposures above the 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. The use of local exhaust ventilation is recommended to control emissions near the source.

C. Individual protection measures:

Respiratory protection:

- Under conditions of frequent use or heavy exposure, Respiratory protection may be needed.
- Respiratory protection is ranked in order from minimum to maximum.
- Consider warning properties before use.
- Any chemical cartridge respirator with organic vapor cartridge(s).
- Any chemical cartridge respirator with a full facepiece and organic vaporcartridge(s).
- Any air-purifying respirator with a full facepiece and an organic vapor canister.
- For Unknown Concentration or Immediately Dangerous to Life or Health : Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply. Any self-contained breathing apparatus with a full facepiece.

Eye protection:

- Wear primary eye protection such as splash resistant safety goggles with a secondary protection face shield.
- Provide an emergency eye wash station and quick drench shower in the immediate work area.

Hand protection:

- Wear appropriate chemical resistant glove.

Body protection:

- Wear appropriate chemical resistant protective clothing.

9. PHYSICAL AND CHEMICAL PROPERTIES

A. Appearance (physical state, colour etc):

- Appearance : Liquid
- Color : 무색 투명

B. Odour:

독특한 탄화수소 냄새

C. Odour threshold:

Not available

D. pH:

Not available

E. Melting point/freezing point:

7 °C

F. Initial boiling point and boiling range:

81 °C

G. Flash point:

≤ 0 °C

H. Evaporation rate:

560 (ASTM D3539, n-BuAc=100)

I. Flammability(solid, gas) :

Not available

J. Upper/lower flammability or explosive limits:

8.4 / 1.3 %

K. Vapour pressure:

12.7 kPa(20°C)

L. Solubility(ies):

물에 대해 0.01 wt % 미만

M. Vapour density:

2.9 (공기=1)

N. Specific gravity:

0.81

O. Partition coefficient: n-octanol/water:

3.4

P. Auto-ignition temperature:

260 °C

Q. Decomposition temperature:

Not available

R. Viscosity:

0.98mPa·s (20°C)

10. STABILITY AND REACTIVITY**A. Chemical stability:**

- This material is stable under recommended storage and handling conditions.

B. Possibility of hazardous reactivity:

- Cylinders exposed to fire may vent and release flammable gas.

C. Conditions to avoid:

- Avoid contact with incompatible materials and condition.
- Avoid : Accumulation of electrostatic charges, Heating, Flames and hot surfaces
- Avoid contact with heat, sparks, flame or other ignition sources.

D. Incompatible materials:

- Not available

E. Hazardous decomposition products:

- May emit flammable vapour if involved in fire.

11. TOXICOLOGICAL INFORMATION**A. Information on the likely routes of exposures:****○ Inhalation exposure:**

- May be harmful if swallowed and enters airways
- May cause respiratory irritation.

○ Ingestion exposure:

- Not available

○ Skin exposure:

- Causes skin irritation

○ Eye exposure:

- Not available

B. Delayed and immediate effects and also chronic effects from short and long term exposure: **Acute toxicity:**

- * Oral
 - [Hexahydrobenzene] : LD50 = 12705 mg/kg
- * Dermal
 - [Hexahydrobenzene] : LD50 > 2000 mg/kg Rabbit
- * Inhalation
 - [Hexahydrobenzene] : LC50 = 70 mg/ℓ

 Skin corrosion/irritation:

- Causes skin irritation

 Serious eye damage/irritation:

- Not available

 Respiratory sensitization:

- Not available

 Skin sensitization:

- Not available

 Carcinogenicity:

- * IARC
 - Not available
- * OSHA
 - Not available
- * ACGIH
 - Not available
- * NTP
 - Not available
- * EU CLP
 - Not available

 Germ cell mutagenicity:

- Not available

 Reproductive toxicity:

- Not available

 Specific target organ systemic toxicity-single exposure:

- May cause damage to organs (Refer Section SDS 11)
- May cause drowsiness and dizziness.
- May cause respiratory irritation.

 Specific target organ systemic toxicity-repeated exposure:

- Not available

○ **Aspiration hazard:**

- May be harmful if swallowed and enters airways

C. Numerical measures of toxicity(such as acute toxicity estimate):

-

12. ECOLOGICAL INFORMATION

A. Aquatic, terrestrial organisms toxicity:

○ Fish

- Not available

○

Crustaceans

- [Hexahydrobenzene] : EC50 = 0.9 mg/l 48 hr

○ Algae

- Not available

B. Persistence and degradability:

○

Persistence

- Not available

○

Degradability

- Not available

C. Bioaccumulative potential:

○ Bioaccumulative potential

- [Hexahydrobenzene] : BCF = 129

○

Biodegradation

- [Hexahydrobenzene] : Biodegradability = 77 (%) 28 day

D. Mobility in soil:

- Not available

E. Other adverse effects:

- Not available

13. DISPOSAL CONSIDERATIONS

A. Disposal methods:

- Since more than two kinds of designaed waste is mixed, it is difficult to treat seperatly, then can be reduction or stabilization by incineration or similar process.
- If water separation is possible, pre-process with Water separation process.
- Dispose by incineration.
- Incinerate the oil by separating the oil and water
- The remainder of the water after separation will be processed in a water pollution prevention facilities.
- Do incineration or stabilization of the residue after disposal as the method of evaporation and concentration.
- Do incineration of the residue after disposal as the method of agglomeration and precipitation.
- Take care of incinerate or stabilization after treatment, purified by means of Separation,distillation,extractio,filtration,pyrolysis

B. Disposal considerations(Specify disposal container and methods):

- The user of this product must disposal by oneself or entrust to waste disposer or person who other's waste recycle and dispose, person who establish and operate waste disposal facilities.
- Dispose of waste in accordance with all applicable laws and regulations.

14. TRANSPORT INFORMATION**A. UN Number:**

- 1145

B. UN Proper Shipping Name:

- Cyclohexane

C. Transport hazard class(es):

- 3

D. Packing group, if applicable:

- II

E. Environmental hazards:

- Applicable

F. Special precautions for user:

- Local transport follows in accordance with Dangerous goods Safety Management Law.
- Package and transport follow in accordance with Department of Transportation (DOT) and other regulatory agency requirements.

- EmS FIRE SCHEDULE : F-E (Non-water-reactive flammable liquids)

15. REGULATORY INFORMATION

A. Safety, health and environmental regulations specific for the product in question:

POPs Management

Law

- Not applicable

Information of EU

Classification

*

Classification

- [Hexahydrobenzene] : F R11Xn R65Xi R38R67N R50-53

* Risk

Phrases

- [Hexahydrobenzene] : R11, R38, R65, R67, R50/53

* Safety

Phrase

- [Hexahydrobenzene] : S2, S9, S16, S25, S33, S60, S61, S62

U.S. Federal regulations

* OSHA PROCESS SAFETY (29CFR1910.119)

- Not applicable

* CERCLA Section 103 (40CFR302.4)

- [Hexahydrobenzene] : 453.599 kg 1000 lb

* EPCRA Section 302 (40CFR355.30)

- Not applicable

* EPCRA Section 304 (40CFR355.40)

- Not applicable

* EPCRA Section 313 (40CFR372.65)

- [Hexahydrobenzene] : Applicable

- Rotterdam Convention listed ingredients
 - Not applicable
- Stockholm Convention listed ingredients
 - Not applicable

16. OTHER INFORMATION

A. References and sources for data:

- The information contained herein is believed to be accurate. It is provided independently of any sale of the product for purpose of hazard communication. It is not intended to constitute performance information concerning the product. No express warranty, or implied warranty of merchantability or fitness for a particular purpose is made with respect to the product or the information contained herein.
- This Safety Data Sheet was compiled with data and information from the following sources: KOSHA, NITE, ESIS, NLM, SIDS, IPCS

B. Originated date:

- 2015-06-11

C. Revision number and date:

Revision number : 1
Revision Date : 2016.10.02