

High purity n-Hexane

1. identification

A. Product Name : High purity n-Hexane

B. Recommended use : Solvents
restriction on use : Not available

C. Manufacturer/Supplier

1) Supplier/Distributor information

GODO CHEMICAL Corporation			
#1017, 10F Suseo Hyundai Ventureville 10 Bamgogae-ro 1-gil Gangnam-gu Seoul 06349 Korea			
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2. hazard identification

A. GHS Classification

1) Physical Hazards

- Flammable liquids : Category 2

2) Health Hazards

- Skin corrosion/irritation : Category2

- Serious eye damage/irritation : Category2A

- Reproductive toxicity : Category2

- Specific target organ toxicity(Single exposure) : Category3(Narcotic effects)

- Specific target organ toxicity(Single exposure) : Category3(Respiratory tract irritation)

- Specific target organ toxicity(Repeated exposure) : Category1

- Aspiration hazard : Category1

3) Environmental Hazards

- Chronic aquatic toxicity : Category 2

B. GHS label elements

1) Hazard symbols :



2) Signal words : Danger

3) Hazard statements :

H225 Highly flammable liquid and vapor

H304 May be fatal if swallowed and enters airways

H315 Causes skin irritation

H319 Causes serious eye irritation

H335 May cause respiratory irritation.

H336 May cause drowsiness and dizziness.

H361 Suspected of damaging fertility or the unborn child

H372 Causes damage to organs through prolonged or repeated exposure (Refer Section SDS 11)

H411 Toxic to aquatic life with long lasting effects

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4) Precautionary statements :

■Prevention

- P201 Obtain special instructions before use.
- P202 Do not handle until all safety precautions have been read and understood.
- 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. Flammable liquids (chapter 2.6) 1, 2, 3
- P243 Take precautionary measures against static discharge.
- P260 Do not breathe gas/mist/vapors/spray.
- P261 Avoid breathing gas/mist/vapors/spray.
- P264 Wash hands thoroughly after handling.
- P270 Do not eat, drink or smoke when using this product.
- 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.
- P281 Use personal protective equipment as required.

■Response

- 301+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.
- P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P308+P313 If exposed or concerned: Get medical advice/attention.
- P312 Call a POISON CENTER or doctor/physician if you feel unwell.
- P314 Get medical advice/attention if you feel unwell.
- P321 Specific treatment
- P331 Do NOT induce vomiting.
- P332+P313 If skin irritation occurs: Get medical advice/attention.
- P337+P313 If eye irritation persists: Get medical advice/attention.
- P362 Take off contaminated clothing and wash before reuse.
- P370+P378 In case of fire: Use Suitable extinguishing media for extinction(Refer Section SDS 5).
- 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.

■Disposal

- P501 Dispose of contents/container in accordance with local/regional/national/international regulation
- P405 Store locked up.

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C. Other hazards which do not result in classification : (NFPA Classification)
 NFPA grade (0 ~ 4 level) : Health : 2 , Flammability : 3, Reactivity : 0

3. composition/information on ingredients

Chemical Name	Trade names and Synonyms	CAS No.	Content(%)
n-Hexane	Hexane	110-54-3	99-100
cyclopentane	Not applicable	96-37-7	96-37-7

4. first aid measures

- Immediately flush eyes with plenty of water for at least 15minutes and call a doctor/physician.
- Get medical attention immediately.
- Go to the hospital immediately if symptoms(flare, irritate) occur.
- Remove contact lenses if worn.

B. Skin contact :

- Flush skin with plenty of water 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 contact :

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

D. Ingestion contact :

- 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. Delayed and immediate effects and also chronic effects from short and long term exposure:

- Not available

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F. Notes to physician

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

5. firefighting measures

A. Suitable (Unsuitable) extinguishing media :

- 1) Suitable extinguishing media : alcohol form, carbon dioxide, water spray, dry sand and earth
- 2) Unsuitable extinguishing media: Avoid use of water jet for extinguishing.
- 3) In case of large fire : spraying, watering

B. Specific hazards arising from the chemical

- Highly flammable liquid and vapor
- Polymerization may cause fire and explosion.
- Vapor may be released to the ignition source and ignited.
- May form explosive mixture at or above flash point
- Container may explode on heating
- Highly flammable: easily ignited by heat, spark, flame
- Leaks are a fire / explosion hazard.
- Vapors may explode indoors, outdoors, and in drains
- Vapor may travel to the source of ignition and flash back.
- Vapors may cause dizziness or suffocation without knowledge.
- May cause irritating, corrosive and toxic gases in case of fire
- Inhalation and contact may irritate or burn the skin and eyes.

C. Special protective actions for firefighters :

- In the event of a leaking fire, do not extinguish the fire unless you can safely prevent the leaking.
- Remove all ignition sources if safe to do so.
- Fire fighters should wear appropriate protective equipment.
- Please digested outside the area by keeping a safe distance.
- Find and use appropriate evolutionary methods for your surroundings.
- Wear appropriate protective equipment if necessary.
- Move container from fire area if it is not hazardous.
- Vapors or gases may ignite at distant ignition sources and spread rapidly..
- Do not pour water directly into the exposure source or safety equipment as it may freeze in the event of a tank fire.
- In case of tank fire, extinguish at maximum distance or use unmanned fire fighting equipment.
- Cool containers with large amounts of water even after tank fire has extinguished.
- In the event of a fire in the tank, if there is a high sound level on the pressure relief device or if the tank is discolored, immediately withdraw it.
- In case of tank fire, back off the flame tank.
- In the event of a large fire, use unmanned fire fighting equipment and allow it to retreat if it is impossible.

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6. additional release measures

A. Personal precautions, protective equipment and emergency procedures :

- Avoid breathing dust / fume / gas / mist / vapors / spray.
- Remove all ignition sources because very fine particles may cause fire or explosion.
- Wipe off any spills immediately and follow all protective precautions.
- Isolate contaminated areas.
- If you do not need to enter or do not have protective equipment, do not go in.
- If possible, turn the leak container to release it as a gas rather than a liquid.
- Do not pour into leak sources directly.
- Use water spray to reduce vapors or scatter vapor clouds and prevent water from coming into contact with spills.
- Always ground all equipment when handling materials.
- Keep the substance scattered.
- Stop the leak if it is not dangerous.
- Some leave flammable residues after evaporation.
- Do not touch a damaged container or spill without adequate protection.

B. Environmental precautions :

- Prevent runoff and contact with waterways, drains or sewers.
- Do not allow vapors to escape through drains, ventilation, or enclosed spaces.
- If large amounts have been spilled, inform the relevant authorities.

C. Methods and materials for containment and cleaning up :

- Pile up the embankment and collect the water for digestion.
- Absorb spillage with inert materials (eg dry sand or earth) and place in a chemical waste container.
- Absorb liquid and rinse contaminated area with detergent and water.
- Notification to central government, local government. When emissions at least of the standard Amount

7. handling and storage

A. Precautions for safe handling :

- Do not handle until all safety precautions have been read and understood.
- Handle it outdoors or in a well-ventilated area.
- Do not expose, cut, expose, weld, solder, bond, punch, grind or expose to heat, flames, sparks, static electricity or other sources of ignition
- Follow all SDS / warning label precautions, as product residues may remain even after emptying containers.
- Carefully open the cap before opening.
- Be sure to ground all equipment when handling material.

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B. Conditions for safe storage, including any incompatibilities :

- Keep away from heat / sparks / open flames / hot surfaces. - no smoking
- Keep container tightly closed in a well-ventilated place.
- Avoid direct sunlight.
- The empty drum should be completely drained, properly blocked and immediately returned to the drum regulator or placed properly.
- The container may be pressurized if exposed to heat.

8. exposure controls/personal protection

A. Exposure limits:

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- 1) ACGIH TLV : TWA, 50 ppm (176 mg/m³)
- 2) OSHA PEL : 500ppm 1800mg/m³

B. 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, such as personal protective equipment :

1) 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 vapor cartridge(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.

2) 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.

3) Hand protection

- Wear appropriate chemical resistant glove.

4) Skin protection

- Wear appropriate chemical resistant protective clothing.

5) Others : Not available

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9. physical and chemical properties

- A. Appearance : Colorless liquid
- B. Odor: Gasoline odor
- C. Odor threshold : 60ppm(n-Hexane)
- D. pH : Not available
- E. Melting point/Freezing point : -95°C (n-Hexane)
- F. Initial Boiling Point/Boiling Ranges : 69°C
- G. Flash point: -22°C
- H. Evaporation rate : Not available
- I. Flammability(solid, gas) : Not applicable
- J. Lower/Upper Flammability or explosive limits: 1.1 / 7.5%(n-Hexane)
- K. Vapor pressure: 17 kPa(20°C)
- L. Solubility : 0.0013 g/100ml(20°C)(n-Hexane)
- M. Vapor density(Air=1) : 3
- N. Specific gravity(Relative density) : 0.7 (Water=1)
- O. Partition coefficient of n-octanol/water : 3.9 (20°C)(n-Hexane)
- P. Autoignition temperature : 225°C (n-Hexane)
- Q. Decomposition temperature: Not available
- R. Viscosity : 0.326 cP (25°C)(n-Hexane)
- S. Molecular weight : about 86.18

10. Stability and reactivity

- A. Chemical Stability :
 - This material is stable under recommended storage and handling conditions.
- B. Possibility of hazardous reactions :
 - Cylinders exposed to fire may vent and release flammable gas.
- C. Conditions to avoid :
 - Avoid contact with incompatible materials and condition.
 - Avoid contact with heat, sparks, flame or other ignition sources.
- D. Incompatible materials : Not available
- E. Hazardous decomposition products :
 - May cause irritating, corrosive and toxic gases.

11. Toxicological information

- A. Information on the likely routes of exposure
 - Respiratory tracts :

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- May be fatal if swallowed and enters airways
- May cause respiratory irritation.
- Oral : Not available
- Eye·Skin :
 - Causes serious eye irritation
 - Causes skin irritation

B. Delayed and immediate effects and also chronic effects from short and long term exposure

1) Acute toxicity :

- Oral : Not classified
 - [n-Hexane] : LD50 = 25000 mg/kg Rat (NLM)
- Dermal : Not classified
 - [n-Hexane] : LD50 > 3350 mg/kg Rabbit (ECHA), LD50 = 3000 mg/kg Rabbit (IUCLID)
- Inhalation : Not classified
 - [n-Hexane] : LC50 = 135.7 mg/L/4 hr (EHC, 1991)
 - [Methyl cyclopentane] : Steam LC50 > 20 mg/L 4 hr Rat

2) Skin corrosion/irritation : Category2

- [n-Hexane] : Skin irritation is reported in humans. (NITE(2006))

3) Serious eye damage/irritation : Category2A

- [n-Hexane] : Eye irritation reported in humans. (NITE(2006))

4) Respiratory sensitization : Not available

5) Skin sensitization: Not classified

- [n-Hexane] : Non-sensitizing in mouse. (ECHA)

6) Carcinogenicity : Not available

- NTP : Not available
- IARC : Not available
- ACGIH : Not available
- EU CLP : Not available

7) Germ cell mutagenicity : Not classified

- [n-Hexane] : Rodent dominant lethal test : negative, Micronucleus test using mammalian red blood cells : negative, Chromosome aberration test using mammalian bone marrow cells : negative (NITE (2006))
- [Methyl cyclopentane] : In vivo mammalian bone marrow micronucleus test : negative

8) Reproductive toxicity : Category2

- [n-Hexane] : In rats, testicular tissue injuries accompanied by spermatogenesis inhibition were observed. (NITE)

9) STOT-single exposure : Category3(Narcotic effects)(Respiratory tract irritation)

- [n-Hexane] : In human, acute inhalation toxicity may cause dizziness or inhibition of the central nervous system. Respiratory irritant caused by inhalation exposure to humans.

10) STOT-repeated exposure : Category1

- [n-Hexane] : May cause damage to nervous system through prolonged or repeated exposure.

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- [Methyl cyclopentane] : NOAEL 4.47 mg/L (Rat) – Inhalation exposure results in experimental animals for 13 weeks. There were no significant toxicologic symptoms except for the flexible response observed at the highest concentration group (20.21 mg / L)
- 11) Aspiration hazard : Category1
- [n-Hexane] : Hydrocarbon, dynamic viscosity less than 20.5 mm² / s (NITE)

12. Ecological information

A. Ecotoxicity :

- Acute aquatic toxicity : Not classified
 - Chronic aquatic toxicity : Category2
- 1) Fish :
- [n-Hexane] : LL50 = 12.51 mg/L hr (ECHA), LC50 =113 mg/L 96 hr (ECOTOX)
 - [Methyl cyclopentane] : LC50 2.25 mg/L 96 hr (Estimate)
- 2) Crustaceans :
- [n-Hexane] : LC50 = 3.88 mg/L 48 hr (EHC (1991))
 - [Methyl cyclopentane] : LC50 6.67 mg/L 48hr (Estimate)
- 3) Algae :
- [n-Hexane] : EL50 = 9.285 mg/L 72 h (Estimate)
 - [Methyl cyclopentane] : EC50 4.44 mg/L 96 hr (Estimate)

B. Persistence and degradability:

- 1) Persistence :
- [n-Hexane] : log Kow = 4 (20°C, pH=7) (ECHA)
 - [Methyl cyclopentane] : log Kow 3.37 (UAKRON)
- 2) Degradability : Not available

C. Bioaccumulative potential :

- 1) Bioaccumulative potential :
- [n-Hexane] : BCF = 501.187 (Estimate)
 - [Methyl cyclopentane] : BCF 210 (NLM/HSDB)
- 2) Biodegradation :
- [n-Hexane] : Biodegradability = 100 (%) (existing chemical safety inspections data)

D. Mobility in soil :

- [Methyl cyclopentane] : Koc 1600

E. Other adverse effects : Not available

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13. Disposal Considerations

A. Disposal methods

- Since more than two kinds of designated waste is mixed, it is difficult to treat separately, 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.

B. Special precautions for disposal

- 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 No. (IMDG) : 1208

B. Proper shipping name : HEXANES

C. Hazard Class : 3

D. IMDG Packing group: II

E. Marine pollutant : Applicable

F. Special precautions for user related to transport or transportation measures

- 1) EmS FIRE SCHEDULE : F-E (Non-water-reactive flammable liquids)
- 2) EmS SPILLAGE SCHEDULE : S-D (Flammable liquids)

15. regulatory information

A. Reference:

- EU Regulation 1272/2008
- TOMES; LOLI ; <http://csi.micromedex.com/fraMain.asp?Mnu=0>
- UN Recommendations on the transport of dangerous goods 17th
- IARC Monographs on the Evaluation of Carcinogenic Risks to Humans;
<http://monographs.iarc.fr>
- ECHA CHEM; <http://echa.europa.eu/web/guest/information-on-chemicals/registered-substances>
- OECD SIDS; <http://webnet.oecd.org/Hpv/UI/Search.aspx>
- HSDB; <http://toxnet.nlm.nih.gov/cgi-bin/sis/search2>

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B. Key acronyms

- ACGIH(American Conference of Governmental Industrial Hygienists)
- ECHA(European Chemicals Agency)
- OECD(Organization for Economic Co-operation and Development)
- CERCLA(Comprehensive Environmental Response, Compensation, and Liability Act)
- IARC(International Agency for Research on Cancer)
- OSHA(Occupational Safety and Health Administration)
- NTP(National Toxicology Program)
- NFPA(National Fire Protection Association)
- LC50(Lethal Concentration 50% kill)
- LD50(Lethal Dose 50% kill)
- EC50(50% Effect Concentration)
- STEL(Short Term Exposure Limit)
- TWA(Time weight Average)
- TLV(Threshold Limit Value)

C. Issue date : 2017-02-14

D. Revision number and Last date revised : Not applicable

E. Other :

- This SDS is prepared according to the Globally Harmonized System (GHS).