

MSDS – MATERIAL SAFETY DATA SHEET

From: Ashonuj Chem Pvt. Ltd.

Fact. Tel: +91-22-27781956

43, Princess Street, 3 Devkaran Mansion, Off Tel: +91-22-22084293

1st Floor, Mumbai – 400 002. INDIA.

CYCLOHEXANONE

1. Product Identification

Synonyms: Pimelic ketone; Cyclohexyl ketone; Ketoexamethylene

CAS No.: 108-94-1

Molecular Weight: 98.14

Chemical Formula: C₆H₁₀O

2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---------------|----------|-----------|-----------|
| Cyclohexanone | 108-94-1 | 99 - 100% | Yes |

3. Hazards Identification

Emergency Overview

WARNING! FLAMMABLE LIQUID AND VAPOR. HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. AFFECTS CENTRAL NERVOUS SYSTEM, LIVER AND KIDNEYS. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT.

SAFETY DATA

Health Rating: 2 - Moderate (Life)

Flammability Rating: 2 - Moderate

Reactivity Rating: 1 - Slight

Contact Rating: 3 - Severe (Life)

Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD;
PROPER GLOVES; CLASS B EXTINGUISHER

Storage Color Code: Red (Flammable)

Potential Health Effects

Inhalation:

Causes irritation to the respiratory tract. Symptoms may include coughing, shortness of breath. High concentrations have a narcotic effect. Irritation effects normally prevent exposures high enough to cause systemic effects.

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. May be absorbed through the skin with possible systemic effects.

Eye Contact:

Vapors may cause irritation. Contact may cause corneal injury.

Chronic Exposure:

Prolonged or repeated exposure may cause skin rash or dermatitis. Damage to the liver and kidneys may occur.

Aggravation of Pre-existing Conditions:

Persons with pre-existing skin, eye or central nervous system disorders, or impaired liver, kidney, or pulmonary function may be more susceptible to the effects of this substance.

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:

Give large amounts of water to drink. Never give anything by mouth to an unconscious person. Get medical attention.

Skin Contact:

In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing 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.

Note to Physician:

In small ingestions the major concern is aspiration and gastrointestinal decontamination is not recommended. With larger ingestions there is potential for systemic toxicity from gastrointestinal absorption and decontamination is suggested, keeping in mind that aspiration is still a concern.

5. Fire Fighting Measures

Fire:

Flash point: 43.9C (111F)

Autoignition temperature: 420C (788F)

Flammable limits in air % by volume:

lel: 1.1; uel: 9.4

Flammable. (lel @ 100C)

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. Contact with strong oxidizers may cause fire. Sealed containers may rupture when heated. Sensitive to static discharge.

Fire Extinguishing Media:

Dry chemical, foam or carbon dioxide. 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.

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. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of

reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

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.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:

-OSHA Permissible Exposure Limit (PEL): 50 ppm

-ACGIH Threshold Limit Value (TLV): 20 ppm (TWA) 50 ppm (STEL), skin, A3 - Confirmed animal carcinogen with unknown relevance to humans

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 half-face organic vapor respirator may be worn for up to ten times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece organic vapor respirator 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-face piece 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.

9. Physical and Chemical Properties

Appearance: Clear, colorless to slightly yellow, oily liquid.

Odor: Odor is like acetone and peppermint.

Solubility: 15% in water @ 10C (50F).

Specific Gravity: 0.94 @ 25C/4C

pH: No information found.

% Volatiles by volume @ 21C (70F): 100

Boiling Point: 155C (311F)

Melting Point: -31C (-24F)

Vapor Density (Air=1): 3.4

Vapor Pressure (mm Hg): 5 @ 26C (79F)

Evaporation Rate (BuAc=1): 0.29

10. Stability and Reactivity

Stability:

Stable under ordinary conditions of use and storage.

Hazardous Decomposition Products:

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

Hazardous Polymerization:

Will not occur.

Incompatibilities:

Strong oxidizing agents. May cause spontaneous ignition and violent reaction. May attack plastics, resins, and rubber.

Conditions to Avoid:

Heat, flames, ignition sources and incompatibles.

11. Toxicological Information

Oral rat LD50: 1800 mg/kg; Inhalation rat LC50: 8000ppm/4-hour; Skin rabbit LD50: 1 mL/kg; Irritation: eye rabbit, Standard Draize: 20 mg, severe; skin rabbit, Open Draize: 500 mg, mild. Investigated as a tumorigen, mutagen and reproductive effector.

-----\Cancer Lists\-----

| Ingredient | ---NTP Carcinogen--- | | |
|--------------------------|----------------------|-------------|---------------|
| | Known | Anticipated | IARC Category |
| Cyclohexanone (108-94-1) | No | No | 3 |

12. Ecological Information

Environmental Fate:

When released into the soil, this material is expected to readily biodegrade. When released into the soil, this material is expected to quickly evaporate. When released into the soil, this material is expected to leach into groundwater. When released into water, this material may evaporate to a moderate extent. When released into water, this material may biodegrade to a moderate extent. This material has an estimated bioconcentration factor (BCF) of less than 100. This material is not expected to significantly bioaccumulate. 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:

The LC50/96-hour values for fish are over 100 mg/l.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved incinerator or disposed in a RCRA 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.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: CYCLOHEXANONE

Hazard Class: 3

UN/NA: UN1915

Packing Group: III

Information reported for product/size: 2.5L

International (Water, I.M.O.)

Proper Shipping Name: CYCLOHEXANONE

Hazard Class: 3

UN/NA: UN1915

Packing Group: III

Information reported for product/size: 2.5L

15. Regulatory Information

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-----\Chemical Inventory Status - Part 1\-----
Ingredient                                TSCA  EC   Japan  Australia
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Cyclohexanone (108-94-1)                 Yes   Yes  Yes    Yes
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-----\Chemical Inventory Status - Part 2\-----
Ingredient                                Korea  --Canada--
                                           DSL    NDSL   Phil.
-----
Cyclohexanone (108-94-1)                 Yes   Yes   No     Yes
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-----\Federal, State & International Regulations - Part 1\-----
Ingredient                                -SARA 302-  -SARA 313-
                                           RQ    TPQ    List  Chemical Catg.
-----
Cyclohexanone (108-94-1)                 No    No     No     No
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-----\Federal, State & International Regulations - Part 2\-----
Ingredient                                CERCLA  -RCRA-  -TSCA-
                                           261.33  8(d)
-----
Cyclohexanone (108-94-1)                 5000   U057    No
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Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: Yes Fire: Yes Pressure: No
Reactivity: No (Pure / Liquid)

Australian Hazchem Code: 3[Y]

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: 1 Flammability: 2 Reactivity: 0

Label Hazard Warning:

WARNING! FLAMMABLE LIQUID AND VAPOR. HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. AFFECTS CENTRAL NERVOUS SYSTEM, LIVER AND KIDNEYS. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT.

Label Precautions:

Avoid contact with eyes, skin and clothing.
Avoid breathing vapor or mist.
Keep container closed.
Keep away from heat, sparks and flame.
Wash thoroughly after handling.

Use only with adequate ventilation.

Label First Aid:

If swallowed, give large amounts of water to drink. Never give anything by mouth to an unconscious person. 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 while removing contaminated clothing and shoes. Wash clothing before reuse. In all cases call a physician.

Product Use:

Laboratory Reagent.

Revision Information: No Changes.

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