



Philippine Prosperity Chemicals, Inc.

MATERIAL SAFETY DATA SHEET

Date Reviewed :
October 29, 2009

CYCLOHEXANONE

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: CYCLOHEXANONE
Product Code: CYC
Product Type Chemical Solvent
Company: Philippine Prosperity Chemicals, Inc.
Office Address: U1201 Picadilly Star Building
4th Ave. cor 27th St. Fort Bonifacio Global City, Taguig
Plant Address: PPCI In-land Bulk Terminal – Guiguinto, Bulacan
Contact Numbers: Tel: (632) 621-3104 to 09
Fax: (632) 659-6874
Emergency Numbers: Mobile: 0917.5845496 / 0917.5845509

2. COMPOSITION/INFORMATION ON INGREDIENTS

Substance Formal Name: Cyclohexanone
Substance Chemical Formula: (CH₂)₅CO
Common name: Cyclohexanone
Synonyms: Sextone, pimelic ketone, ketohexamethylene, cyclohexyl ketone, cyclic ketone.
Chemical Abstract Service Registry Number (CAS RNs): 108-94-1

3. HAZARDS IDENTIFICATION

Emergency overview: Combustible liquid and vapor! High vapor concentrations may cause drowsiness and irritation of the eyes or respiratory tract. Prolonged or repeated skin contact may cause drying, cracking, or irritation.

Human Health Hazards:

Inhalation: Occupational exposure limit above 1,000 ppm may cause narcosis and death. Exposure above 80 ppm is already irritating for eyes, throat and respiratory tract.

Ingestion: Gastrointestinal tract irritation. Can be fatal if ingested from 10ml or more.

Skin Contact: Moderate irritation and discomfort possible. Defatting of skin, redness and chemical dermatitis possible. Toxic systemic effects from absorption are possible.

Eye Contact: Severe irritation and discomfort. Reversible and/or irreversible corneal damage may occur.



Chronic Exposure: The substance may be toxic to kidneys, liver, upper respiratory tract, skin, eyes and central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

Aggravation of Pre-existing Conditions: Chronic obstructive pulmonary diseases may be aggravated by exposure above 25 ppm.

4. FIRST AID MEASURES

Inhalation Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Obtain medical attention immediately.

WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive.

Ingestion Obtain medical attention immediately. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person.

Skin Contact Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. If persistent irritation occurs, obtain medical attention. Wash clothing before reuse.

Eye Contact Immediately flush eyes with gentle but large stream of water for at least 15 minutes, lifting lower and upper eyelids occasionally. If persistent irritation occurs, obtain medical attention.

5. Fire Fighting Measure

Fire: Combustible liquid and vapor!
Flash point: 43 °C (109.4 °F)
Auto ignition temperature: 420 °C (788 °F)
Flammable limits in air based on pure CYC % by volume:
Lower Flammable Limit: 1.3; Upper Flammable Limit: 9.4

Explosion: Vapor accumulations may flash and/or explode if ignited. Keep ignition sources like open flames away from the fumes.

Extinguishing media: Dry chemical, alcohol-resistant foam or carbon dioxide. Water spray may only be used to keep fire exposed containers cool, dilute spills to nonflammable mixtures, protect personnel attempting to stop leak and disperse vapors.

Unsuitable extinguishing media: Do not use a solid stream or jet of water, since the stream will scatter and spread the fire.



Special Firefighting Procedure: Stay upwind. Use self-contained breathing apparatus and protective clothing. Vapor may explode if ignited in an enclosed area. Cool exposed containers with water.

Special Information All storage areas should be provided with adequate firefighting facilities and equipment. The liquid produces a vapor that forms explosive mixtures with air especially in conditions at above flash point temperatures. In the event of a fire, contact the nearest fire station. For the company's own firefighters, they should wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full face piece operated in the pressure demand or other positive pressure mode.

6. ACCIDENTAL CONTROL MEASURES

Personal precautions: Avoid contact with skin and eyes. Ventilate area of leak or spill thoroughly. Do not breathe vapor. Remove all heat or ignition sources. Evacuate the area of all non-essential personnel. Shut off leaks, if possible and without personal risk.

Personal protection: Wear appropriate personal protective equipment (PPE) as specified in Section 8.

Environmental precautions: Contain and recover liquid when possible with 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. Use non-sparking tools and equipment. Prevent from spreading or entering into drains, ditches, rivers or other waterways by using sand, earth or other appropriate barriers. Prevent contamination of soil and water.

Clean-up methods - small spillage: Remove all ignition sources and ventilate area. Evacuate all non-essential personnel. Stop leak if without risk. Dilute with water and mop up, or absorb with an inert dry material and place in a sealable container. Label and seal waste containers for product recovery or appropriate disposal (see Section 13).

Clean-up methods – large spillage: For large liquid spills (say more than a drum), remove all ignition sources. Evacuate all non-essential personnel. Stop leak if possible and without risk. Do not flush away residues with water. Blanket spill with alcohol resistant foam to limit evaporation or dike area to contain spill and absorb with earth, sand or other non-combustible material. Transfer to a labeled, sealable container for product recovery or proper disposal. Wear appropriate protective clothing to minimize contact with skin. Allow residues to evaporate or soak up with a suitable absorbent material and dispose safely and appropriately (see Section 13).

7. HANDLING AND STORAGE



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| <i>Handling:</i> | Protect self against physical damage. Avoid contact with skin, eyes and clothing. Do not breathe vapor. Use only in well ventilated areas. |
| <i>Handling temperature:</i> | Ambient. |
| <i>Storage:</i> | Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame). |
| <i>Storage temperature:</i> | Ambient. Avoid storing above 43 °C; otherwise the product may form flammable vapor-air mixtures. |
| <i>Product transfer:</i> | Metal containers should be bonded and grounded for transfers to avoid static sparks. |
| <i>Recommended materials:</i> | For containers or container linings, use mild steel or stainless steel. |
| <i>Unsuitable materials:</i> | Most plastic, aluminum, natural neoprene or nitrile rubbers. |
| <i>Other Information:</i> | Cyclohexanone is available from PPCI in drums. Details are available upon request. |

8. EXPOSURE CONTROL / PERSONAL PROTECTION

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| <i>Engineering Control Measure / Ventilation System:</i> | 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, <i>Industrial Ventilation, A Manual of Recommended Practices</i> , most recent edition, for details. |
| <i>Occupational Exposure Limit Standards:</i> | American Conference of Governmental Industrial Hygienist (ACGIH) |
| <i>Limit type:</i> | Threshold Limit Value (TLV) - the level of exposure that the typical worker can experience without an unreasonable risk of disease or injury. |
| <i>Unit:</i> | Parts per million (ppm) |
| <i>Value:</i> | 25 |
| <i>Respiratory protection:</i> | Where local exhaust ventilation is not applicable, wear a full face-piece or a double cartridge respirator with organic vapor canister NPF 400. It may be worn up to 50 times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, and 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. |



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| <i>Hand protection:</i> | PVC gloves, chemical resistant gloves, nitrile gloves. |
| <i>Eye protection:</i> | Use chemical safety goggles with side shields or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area. |
| <i>Body Protection:</i> | Wear impervious protective clothing such as one-piece overall, including safety shoes or boots, gloves, laboratory coat, apron or any appropriate cotton-made clothing to prevent skin contact. |
| <i>Specific Hygiene Measures:</i> | Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Always maintain and practice good housekeeping. |

9. PHYSICAL AND CHEMICAL PROPERTIES

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| <i>Appearance:</i> | Clear, colorless oily liquid |
| <i>Odor:</i> | Odor is like acetone and peppermint |
| <i>Initial boiling point:</i> | 156 °C (312.8 °F) |
| <i>Freezing point:</i> | -31 °C (-23.8 °F) |
| <i>Vapor Pressure:</i> | 0.66 kPa @ 25 °C |
| <i>Specific Gravity:</i> | 0.9478 @ 20 °C |
| <i>Solubility:</i> | Slightly soluble in water (up to 15% by Volume) |
| <i>Dynamic viscosity:</i> | 2.02 centipoise (cP) @ 25 °C |
| <i>Vapor density (air=1):</i> | 3.4 |
| <i>Flash point:</i> | 43 °C |
| <i>Auto-ignition temperature:</i> | 420 °C |
| <i>Upper flammable limit in air:</i> | 9.4 % (v/v) |
| <i>Lower flammable limit in air:</i> | 1.3 % (v/v) |
| <i>Molecular weight</i> | 98.15 g/mole |
| <i>Evaporation rate, (NBAC = 1):</i> | 0.29 |

10. STABILITY AND REACTIVITY

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| <i>Stability:</i> | Stable under normal temperature and pressure for use and storage. Hygroscopic. |
| <i>Conditions to avoid:</i> | Heat, flames, ignition sources and confined spaces. Slowly decomposed by moisture. |



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| <i>Materials to avoid:</i> | Reacts with strong oxidizing agents, strong acids, amines, nitric acid and alkalis. |
| <i>Hazardous decomposition products:</i> | Carbon dioxide and carbon monoxide may form when heated to decomposition. |

11. TOXICOLOGICAL INFORMATIONS

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| <i>Basis for assessment:</i> | Information given is based on product data. |
| <i>Oral rat, LD₅₀</i> | 2,375 mg/kg |
| <i>Inhalation rat, LC₅₀</i> | 8,000 ppm /4 Hour |
| <i>Skin rabbit, LD₅₀</i> | 950 mg/kg |
| <i>Eye irritation:</i> | Severe irritant. |
| <i>Skin irritation:</i> | Moderate irritant. |
| <i>Human effects:</i> | Long term exposure to high concentration of vapors may cause clouding of the eyes. Prolonged or repeated ingestion or inhalation may affect respiration, behavior and central nervous system. It may also cause kidney damage and affect metabolism (weight loss). |

12. ECOLOGICAL INFORMATION

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| <i>Basis for assessment:</i> | Information given is based on product data. |
| <i>Environmental Fate:</i> | Cyclohexanone is estimated to be highly mobile in soil. In view of its moderate vapor pressure and low adsorption to soil, it would be expected to volatilize from surface soil. Cyclohexanone is readily biodegradable according to aerobic screening tests and therefore would be expected to biodegrade in soil. |
| <i>Bioaccumulation:</i> | The bioconcentration factor (BCF) for cyclohexanone can be estimated to be 2.4. This BCF indicates that cyclohexanone will not bioconcentrate in aquatic organisms and bioaccumulate. |

13. Disposal Considerations

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| <i>Precautions:</i> | Refer to Sections 7 before handling the product or containers. |
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Waste disposal: Whatever CYC cannot be saved for recovery or treating, it should be managed in an appropriate and approved waste disposal facility. Care should in any case be taken to ensure disposal is compliant with statutory and regulatory requirements or local environmental laws.

Product disposal: This product is not suitable for disposal by either landfill or via local sewers, drains, natural streams or rivers. The following advice only applies to the product as supplied. Processing, use or contamination of this product may change the waste management options.

Container disposal: Drain container thoroughly. After draining, vent in a safe place away from sparks and fire. Residues may cause an explosion hazard. Do not pressure cut, weld, braze, solder, drill, grind or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. Send to drum handlers that clean, recondition or metal reclaimer. Disposal of container and unused contents must be in accordance to local regulatory requirements and environmental laws.

14. TRANSPORT INFORMATION

UN Number: 1915
Hazard Class: 3 (Flammable Liquid)
Packing Group: III (Flash point = 43 °C)
Proper shipping name: CYCLOHEXANONE

15. OTHER INFORMATION

Philippine Prosperity Chemicals, Inc. provides the information contained herein in good faith and was obtained from sources which we believe are reliable. However, the information is provided without any warranty. The condition or methods of handling, storage, use and disposal are beyond our control and may be beyond our knowledge. For this and any other reasons we don't assume responsibility and disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use and disposal of the product. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose.