Material Safety Data Sheet

Date Printed: 15/DEC/2004
Date Updated: 24/MAY/2004
Version 1.5
According to 91/155/EEC

1 - Product and Company Information

Product Name	CYCLOHEXANONE, STANDARD FOR GC
Product Number	02482
Company	Sigma-Aldrich Pte Ltd #08-01 Citilink Warehouse Singapore 118529 Singapore
Technical Phone #	65 271 1089
Fax	65 271 1571

2 - Composition/Information on Ingredients

Product Name	CAS #	EC no	Annex I Index Number
CYCLOHEXANONE	108-94-1	203-631-1	606-010-00-7

Formula	C6H10O
Molecular Weight	98.15 AMU
Synonyms	Anone * Cicloesanone (Italian) * Cyclohexanon (Dutch) * Cyclohexanone (ACGIH:OSHA) * Cyclohexyl ketone * Cykloheksanon (Polish) * Hexanon * Hytrol O * Ketohexamethylene * Nadone * NCI-C55005 * Pimelic ketone * Pimelin ketone * RCRA waste number U057 * Sextone

3 - Hazards Identification

SPECIAL INDICATION OF HAZARDS TO HUMANS AND THE ENVIRONMENT
Flammable. Harmful by inhalation.

4 - First Aid Measures

AFTER INHALATION
If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

AFTER SKIN CONTACT
In case of contact, immediately wash skin with soap and copious amounts of water.

AFTER EYE CONTACT
In case of contact, immediately flush eyes with copious amounts of water for at least 15 minutes.

AFTER INGESTION
If swallowed, wash out mouth with water provided person is conscious. Call a physician.

5 - Fire Fighting Measures

EXTINGUISHING MEDIA
Suitable: Water spray. Carbon dioxide, dry chemical powder, or appropriate foam.

SPECIAL RISKS
Specific Hazard(s): Emits toxic fumes under fire conditions. Combustible liquid.

SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS
Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

6 - Accidental Release Measures

PERSONAL PRECAUTION PROCEDURES TO BE FOLLOWED IN CASE OF LEAK OR SPILL
Evacuate area.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)
Wear respirator, chemical safety goggles, rubber boots, and heavy rubber gloves.

METHODS FOR CLEANING UP
Absorb on sand or vermiculite and place in closed containers for disposal. Ventilate area and wash spill site after material pickup is complete.

7 - Handling and Storage

HANDLING
Directions for Safe Handling: Do not breathe vapor. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure.

STORAGE
Conditions of Storage: Keep tightly closed. Keep away from heat and open flame.

8 - Exposure Controls / Personal Protection

ENGINEERING CONTROLS
Mechanical exhaust required. Safety shower and eye bath.

GENERAL HYGIENE MEASURES
Wash thoroughly after handling.

EXPOSURE LIMITS

Country	Source	Type	Value
Poland		NDS	40 MG/M3
Poland		NDSCh	80 MG/M3
Poland		NDSP	-

EXPOSURE LIMITS - EUROPEAN UNION

Source	Type	Value
OEL	OEL	40.8 mg/m3
		10 ppm

Remarks: Skin

EXPOSURE LIMITS - DENMARK

Source	Type	Value
OEL	TWA	40 mg/m3
		10 ppm

Remarks: H

EXPOSURE LIMITS - GERMANY

Source	Type	Value
TRGS 900	OEL	80 mg/m3
		20 ppm

Remarks: =1=
Remarks: H,Y

EXPOSURE LIMITS - NORWAY

Source	Type	Value
	OEL	80 mg/m3
		20 ppm

Remarks: H

EXPOSURE LIMITS - SWEDEN

Source	Type	Value
	LLV (Level	100 mg/m3
		25 ppm

Remarks: H

EXPOSURE LIMITS - SWITZERLAND

Source	Type	Value
OEL	OEL	100 mg/m3
		25 ppm

Remarks: C H

EXPOSURE LIMITS - UNITED KINGDOM

Source	Type	Value
OEL	OEL	102 mg/m3
		25 ppm
OEL	STEL	408 mg/m3
		100 ppm

PERSONAL PROTECTIVE EQUIPMENT
Respiratory Protection: Government approved respirator.
Hand Protection: Compatible chemical-resistant gloves.
Eye Protection: Chemical safety goggles.

9 - Physical and Chemical Properties

Appearance: Physical State: Clear liquid
Color: Colorless

Property	Value	At Temperature or Pressure
pH	N/A	
BP/BP Range	154 - 156 °C	
MP/MP Range	-47 °C	
Flash Point	44 °C	Method: closed cup
Flammability	N/A	
Autoignition Temp	420 °C	
Oxidizing Properties	N/A	
Explosive Properties	N/A	
Explosion Limits	Lower: 1.1 % Upper: 9.4 %	
Vapor Pressure	10 mmHg	38.7 °C
SG/Density	0.947 g/cm3	
Partition Coefficient	Log Kow: 0.81	
Viscosity	N/A	
Vapor Density	3.4 g/l	
Saturated Vapor Conc.	N/A	
Evaporation Rate	N/A	

Bulk Density	N/A
Decomposition Temp.	N/A
Solvent Content	N/A
Water Content	N/A
Surface Tension	35.05 mN/m 20 °C
Conductivity	N/A
Miscellaneous Data	N/A
Solubility	Solubility in Water:50 mg/ml H2O Other Solvents: SOLUBLE IN ACETONE, ETHANOL ETHYL ETHER

10 - Stability and Reactivity

STABILITY
Stable: Stable.
Materials to Avoid: Oxidizing agents, Plastics.

HAZARDOUS DECOMPOSITION PRODUCTS
Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide.

HAZARDOUS POLYMERIZATION
Hazardous Polymerization: Will not occur

11 - Toxicological Information

RTECS NUMBER: GW1050000

ACUTE TOXICITY

LD50
Oral
Rat
1620 UL/KG

LC50
Inhalation
Rat
8,000 ppm
4H

LD50
Intraperitoneal
Rat
1130 MG/KG
Remarks: Gastrointestinal:Other changes.

LD50
Subcutaneous
Rat
2170 MG/KG

LD50
Oral
Mouse
1400 mg/kg

LD50
Intraperitoneal
Mouse
1230 MG/KG
Remarks: Gastrointestinal:Other changes.

LD50
Skin
Rabbit
1 ML/KG

LD50
Intraperitoneal
Rabbit
1540 MG/KG
Remarks: Gastrointestinal:Other changes.

LD50
Oral
Mammal
3000 mg/kg

LC50
Inhalation
Mammal
25,000 mg/m3

IRRITATION DATA

Eyes
Human
75 ppm

Skin
Rabbit
500 mg
Remarks: Open irritation test

Eyes
Rabbit
20 mg
Remarks: Severe irritation effect

Eyes
Rabbit
0.25 mg
24H
Remarks: Severe irritation effect

SIGNS AND SYMPTOMS OF EXPOSURE
Prolonged or repeated exposure to skin causes defatting and dermatitis. Symptoms of exposure may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting. Exposure can cause: CNS depression. Incoordination. To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

ROUTE OF EXPOSURE
Skin Contact: May cause skin irritation.
Skin Absorption: Harmful if absorbed through skin. Readily absorbed through skin.
Eye Contact: Causes severe eye irritation.
Inhalation: Harmful if inhaled. Material is irritating to mucous membranes and upper respiratory tract.
Ingestion: Harmful if swallowed.

TARGET ORGAN INFORMATION

Liver. Kidneys. Central nervous system. Lungs.

CHRONIC EXPOSURE - CARCINOGEN
Result: This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

IARC CARCINOGEN LIST

Rating: Group 3

CHRONIC EXPOSURE - MUTAGEN

Human
100 UMOL/L
Cell Type: leukocyte
Cytogenetic analysis

Human
5 UG/L
Cell Type: lymphocyte
Cytogenetic analysis

Hamster
7500 UL/L
Cell Type: ovary
Sister chromatid exchange

Hamster
7500 UL/L
Cell Type: ovary
Mutation in mammalian somatic cells.

CHRONIC EXPOSURE - REPRODUCTIVE HAZARD
Result: Overexposure may cause reproductive disorder(s) based on tests with laboratory animals.

Species: Rat
Dose: 105 MG/M3/4H
Route of Application: Inhalation
Exposure Time: (1-20D PREG)
Result: Effects on Fertility: Pre-implantation mortality (e.g., reduction in number of implants per female; total number of implants per corpora lutea).

Species: Mouse
Dose: 11 GM/KG
Route of Application: Oral
Exposure Time: (8-12D PREG)
Result: Effects on Newborn: Growth statistics (e.g., reduced weight gain).

Species: Mouse
Dose: 1400 PPM/6H
Route of Application: Inhalation
Exposure Time: (6-17D PREG)
Result: Maternal Effects: Other effects. Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Specific Developmental Abnormalities: Musculoskeletal system.

12 - Ecological Information

ECOTOXICOLOGICAL EFFECTS

Test Type: EC50 Daphnia
Species: Daphnia magna
Time: 24 h
Value: 820 mg/l

Test Type: LC50 Fish
Species: Leuciscus idus
Time: 48 h
Value: 536 - 752 mg/l

Test Type: LC50 Fish
Species: Pimephales promelas (Fathead minnow)
Time: 96 h
Value: 480 - 630 mg/l

13 - Disposal Considerations

SUBSTANCE DISPOSAL
Contact a licensed professional waste disposal service to dispose of this material. This combustible material may be burned in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state, and local environmental regulations.

14 - Transport Information

RID/ADR
UN#: 1915
Class: 3
PG: III
Proper Shipping Name: Cyclohexanone

IMDG
UN#: 1915
Class: 3
PG: III
Proper Shipping Name: Cyclohexanone
Marine Pollutant: No
Severe Marine Pollutant: No

IATA
UN#: 1915
Class: 3
PG: III
Proper Shipping Name: Cyclohexanone
Inhalation Packing Group I: No

15 - Regulatory Information

CLASSIFICATION AND LABELING ACCORDING TO EU DIRECTIVES
ANNEX I INDEX NUMBER: 606-010-00-7
INDICATION OF DANGER: Xn
Harmful.
R-PHRASES: 10 20
Flammable. Harmful by inhalation.
S-PHRASES: 25
Avoid contact with eyes.

COUNTRY SPECIFIC INFORMATION

Germany

WGK: 1

SWITZERLAND
SWISS POISON CLASS: 4

NORWAY

Labelling for organic solvents where the package is 1liter or more.
YL-tall m3/l: 8312
YL-group: 5
Safety phrases: 38 42 210
In case of insufficient ventilation, wear suitable respiratory equipment. During fumigation/spraying wear suitable respiratory equipment. Use compressed air- or fresh air line breathing apparatus in confined spaces.

16 - Other Information

WARRANTY
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale.

DISCLAIMER
For R&D use only. Not for drug, household or other uses.