

# Material Safety Data Sheet

## Cyclohexane, 99+%, Spectrophotometric Grade

ACC# 00498

### Section 1 - Chemical Product and Company Identification

**MSDS Name:** Cyclohexane, 99+%, Spectrophotometric Grade

**Catalog Numbers:** AC167740000, AC167740010, AC167740025, AC167745000

**Synonyms:** Benzene Hexahydride; Hexahydrobenzene; Hexamethylene; Hexanaphthalene.

**Company Identification:**

Acros Organics N.V.

One Reagent Lane

Fair Lawn, NJ 07410

**For information in North America, call:** 800-ACROS-01

**For emergencies in the US, call CHEMTREC:** 800-424-9300

### Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
110-82-7	Cyclohexane	>99%	203-806-2

**Hazard Symbols:** F

**Risk Phrases:** 11

### Section 3 - Hazards Identification

#### EMERGENCY OVERVIEW

Appearance: colorless liquid. Flash Point: -20 deg C. **Danger!** Aspiration hazard if swallowed. Can enter lungs and cause damage. May cause respiratory and digestive tract irritation. May cause eye and skin irritation. May cause central nervous system depression. May cause liver and kidney damage. Highly flammable. May form explosive peroxides.

**Target Organs:** Kidneys, central nervous system, liver, cardiovascular system.

#### Potential Health Effects

**Eye:** May cause mild eye irritation.

**Skin:** May be absorbed through the skin in harmful amounts. May cause irritation with burning pain, itching and redness.

**Ingestion:** Ingestion of large amounts may cause gastrointestinal irritation. May cause liver and kidney damage. May cause central nervous system depression, characterized by excitement, followed by headache, dizziness, drowsiness, and nausea. Advanced stages may cause collapse, unconsciousness, coma and possible death due to respiratory failure. May cause vascular collapse and damage. Aspiration of material into the lungs may cause chemical pneumonitis, which may be fatal.

**Inhalation:** Inhalation of high concentrations may cause central nervous system effects characterized by nausea, headache, dizziness, unconsciousness and coma. May cause respiratory tract irritation. May be fatal if exposed to high concentrations.

**Chronic:** Prolonged or repeated skin contact may cause defatting and dermatitis. May cause liver and kidney damage.

### Section 4 - First Aid Measures

**Eyes:** Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid. Do NOT allow victim to rub or keep eyes closed.

**Skin:** Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

**Ingestion:** Do NOT induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Possible aspiration hazard. Get medical aid immediately.

**Inhalation:** Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Get medical aid. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

**Notes to Physician:** Treat symptomatically and supportively.

### Section 5 - Fire Fighting Measures

**General Information:** As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Vapors may form an explosive mixture with air. Vapors can travel to a source of ignition and flash back. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Extremely flammable. Material will readily ignite at room temperature. Use water spray to keep fire-exposed containers cool. Liquid will float and may reignite on the surface of water. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas. May polymerize explosively when involved in a fire. Containers may explode when heated.

**Extinguishing Media:** Water may be ineffective. This material is lighter than water and insoluble in water. The fire could easily be spread by the use of water in an area where the water cannot be contained. Do NOT use straight streams of water. For large fires, use water spray, fog or regular foam. For small fires, use dry chemical, carbon dioxide, water spray or regular foam. Cool containers with flooding quantities of water until well after fire is out.

**Flash Point:** -20 deg C ( -4.00 deg F)

**Autoignition Temperature:** 245 deg C ( 473.00 deg F)

**Explosion Limits, Lower:**1.3

Upper: 8.0

NFPA Rating: (estimated) Health: 1; Flammability: 3; Instability: 0

## Section 6 - Accidental Release Measures

**General Information:** Use proper personal protective equipment as indicated in Section 8.

**Spills/Leaks:** Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Wear a self contained breathing apparatus and appropriate Personal protection. (See Exposure Controls, Personal Protection section). Scoop up with a nonsparking tool, then place into a suitable container for disposal. Remove all sources of ignition. Provide ventilation.

## Section 7 - Handling and Storage

**Handling:** Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use only in a well-ventilated area. Do not reuse this container. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Avoid contact with heat, sparks and flame. Do not get on skin or in eyes. Avoid ingestion and inhalation. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

**Storage:** Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Flammables-area.

## Section 8 - Exposure Controls, Personal Protection

**Engineering Controls:** Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

### Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Cyclohexane	100 ppm TWA	300 ppm TWA; 1050 mg/m <sup>3</sup> TWA 1300 ppm IDLH	300 ppm TWA; 1050 mg/m <sup>3</sup> TWA

**OSHA Vacated PELs:** Cyclohexane: 300 ppm TWA; 1050 mg/m<sup>3</sup> TWA

### Personal Protective Equipment

**Eyes:** Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

**Skin:** Wear neoprene gloves, apron, and/or clothing. Wear nitrile-latex gloves, apron, and/or clothing.

**Clothing:** Wear appropriate protective clothing to prevent skin exposure.

**Respirators:** Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

## Section 9 - Physical and Chemical Properties

**Physical State:** Liquid

**Appearance:** colorless

**Odor:** sweetish odor - chloroform-like

**pH:** Not available.

**Vapor Pressure:** 95 mm Hg

**Vapor Density:** 2.90

**Evaporation Rate:**6.1 (Butyl acetate=1)

**Viscosity:** 1.02 cP at 63F.

**Boiling Point:** 80.7 deg C

**Freezing/Melting Point:**6.5 deg C

**Decomposition Temperature:**Not available.

**Solubility:** Practically insoluble in water.

**Specific Gravity/Density:**0.8 (Water=1)

**Molecular Formula:**CH<sub>2</sub>(CH<sub>2</sub>)<sub>4</sub>CH<sub>2</sub>

**Molecular Weight:**84.084

## Section 10 - Stability and Reactivity

**Chemical Stability:** Stable at room temperature in closed containers under normal storage and handling conditions. Explosive peroxides may form on concentration. Peroxides can be detonated by friction, impact, or heating. Peroxide formation may occur in containers that have been opened and remain in storage. Normally stable; however, on long term storage, materials containing similar functional groups form peroxides of unknown stability.

**Conditions to Avoid:** Incompatible materials, ignition sources, excess heat, oxidizers.

**Incompatibilities with Other Materials:** Strong oxidizing agents, nitrogen dioxide.

**Hazardous Decomposition Products:** Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.

**Hazardous Polymerization:** Has not been reported.

## Section 11 - Toxicological Information

**RTECS#:****CAS#** 110-82-7: GU6300000**LD50/LC50:**

CAS# 110-82-7:

Draize test, rabbit, skin: 1548 mg/2D (Intermittent);

Oral, mouse: LD50 = 813 mg/kg;

Oral, rat: LD50 = 12705 mg/kg;

**Carcinogenicity:**

CAS# 110-82-7: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

**Epidemiology:** No information available.**Teratogenicity:** No information available.**Reproductive Effects:** No information available.**Neurotoxicity:** No information available.**Mutagenicity:** DNA damage; E. coli, 10 umol/L**Other Studies:** None.

## Section 12 - Ecological Information

**Ecotoxicity:** Fish: Fathead Minnow: LC50 = 117.0 mg/L; 96 Hr.; Static conditions Bluegill/Sunfish: LC50 = 34.72 mg/L; 96 Hr.; 25 degrees C flea Daphnia: EC50 = 400.00 mg/L; 48 Hr.; Unspecified ria: Phytobacterium phosphoreum: EC50 = 227.00 mg/L; 5, 30 minutes; Microtox test No data available.**Environmental:** Atmospheric Fate: Cyclohexane is expected to partition to the atmosphere where it will rapidly react with hydroxyl radicals. TERRESTRIAL FATE: If released on land, cyclohexane will be lost through volatilization and should leach into the ground.

Cyclohexane is resistant to biodegradation but may biodegrade slowly in the presence of other hydrocarbons that are themselves degraded. AQUATIC FATE: Volatilization from water (estimated half-life 2 hr in a model river) should be the most important fate process occurring in aquatic systems.

**Physical:** ATMOSPHERIC FATE: In the atmosphere, cyclohexane will degrade by reaction with photochemically produced hydroxyl radicals (half-life 52 hr). The half-life is much faster under photochemical smog conditions with half-lives as low as 6 hr being reported.**Other:** No experimental data are available on the bioconcentration of cyclohexane in aquatic organisms. Using the octanol/water partition coefficient, 3.44, one can estimate a BCF of 242 using a recommended regression equation.

## Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

**RCRA P-Series:** None listed.**RCRA U-Series:** CAS# 110-82-7: waste number U056 (Ignitable waste).

## Section 14 - Transport Information

	US DOT	IATA	RID/ADR	IMO	Canada TDG
<b>Shipping Name:</b>	CYCLOHEXANE				No information available.
<b>Hazard Class:</b>	3				
<b>UN Number:</b>	UN1145				
<b>Packing Group:</b>	II				

## Section 15 - Regulatory Information

**US FEDERAL****TSCA**

CAS# 110-82-7 is listed on the TSCA inventory.

**Health & Safety Reporting List**

CAS# 110-82-7: Effective Date: 12/19/85; Sunset Date: 12/19/95

**Chemical Test Rules**

None of the chemicals in this product are under a Chemical Test Rule.

**Section 12b**

CAS# 110-82-7: 4/12b

**TSCA Significant New Use Rule**

None of the chemicals in this material have a SNUR under TSCA.

**SARA****CERCLA Hazardous Substances and corresponding RQs**

CAS# 110-82-7: 1000 lb final RQ; 454 kg final RQ

**SARA Section 302 Extremely Hazardous Substances**

None of the chemicals in this product have a TPQ.

**SARA Codes**

CAS # 110-82-7: acute, chronic, flammable.

**Section 313**

This material contains Cyclohexane (CAS# 110-82-7, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

**Clean Air Act:**

This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depletors. This material

does not contain any Class 2 Ozone depletors.

**Clean Water Act:**

CAS# 110-82-7 is listed as a Hazardous Substance under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

**OSHA:**

None of the chemicals in this product are considered highly hazardous by OSHA.

**STATE**

CAS# 110-82-7 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts. California No Significant Risk Level: None of the chemicals in this product are listed.

**European/International Regulations**

**European Labeling in Accordance with EC Directives**

**Hazard Symbols:**

F

**Risk Phrases:**

R 11 Highly flammable.

**Safety Phrases:**

S 16 Keep away from sources of ignition - No smoking.

S 33 Take precautionary measures against static discharges.

S 9 Keep container in a well-ventilated place.

**WGK (Water Danger/Protection)**

CAS# 110-82-7: 1

**Canada - DSL/NDSL**

CAS# 110-82-7 is listed on Canada's DSL List.

**Canada - WHMIS**

This product has a WHMIS classification of B2, D2B.

**Canadian Ingredient Disclosure List**

CAS# 110-82-7 is listed on the Canadian Ingredient Disclosure List.

**Exposure Limits**

CAS# 110-82-7: OEL-AUSTRALIA:TWA 300 ppm (1050 mg/m<sup>3</sup>) OEL-AUSTRIA:TWA 300 ppm (1050 mg/m<sup>3</sup>) OEL-BELGIUM:TWA 300 ppm (1030 mg/m<sup>3</sup>) OEL-DENMARK:TWA 300 ppm (1050 mg/m<sup>3</sup>) OEL-FINLAND:TWA 300 ppm (1050 mg/m<sup>3</sup>);STEL 375 ppm (1315 mg/m<sup>3</sup>) OEL-FRANCE:TWA 300 ppm (1050 mg/m<sup>3</sup>);STEL 375 ppm (1300 mg/m<sup>3</sup>) OEL-GERMANY:TWA 300 ppm (1050 mg/m<sup>3</sup>) OEL-HUNGARY:TWA 500 mg/m<sup>3</sup>;STEL 1000 mg/m<sup>3</sup> OEL-JAPAN:TWA 150 ppm (520 mg/m<sup>3</sup>) OEL-THE NETHERLANDS:TWA 300 ppm (1050 mg/m<sup>3</sup>) JAN9 OEL-THE PHILIPPINES:TWA 300 ppm (1050 mg/m<sup>3</sup>) JAN9 OEL-POLAND:TWA 80 mg/m<sup>3</sup> OEL-RUSSIA:TWA 150 ppm;STEL 80 mg/m<sup>3</sup> OEL-SWEDEN:TWA 300 ppm (1000 mg/m<sup>3</sup>);STEL 370 ppm (1300 mg/m<sup>3</sup>) OEL-SWITZERLAND:TWA 300 ppm (1050 mg/m<sup>3</sup>);STEL 600 ppm OEL-TURKEY:TWA 300 ppm (1050 mg/m<sup>3</sup>) OEL-UNITED KINGDOM:TWA 100 ppm;STEL 350 ppm OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGI TLV

Section 16 - Additional Information

**MSDS Creation Date:** 6/04/1999

**Revision #3 Date:** 3/18/2003

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