



The Chemical Company

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Safety Data Sheet

CYCLOHEXYLAMINE

Revision date : 2014/09/08

Version: 2.0

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(30126992/SDS_GEN_US/EN)

1. Identification

Product identifier used on the label

CYCLOHEXYLAMINE

Recommended use of the chemical and restriction on use

Recommended use*: Chemical

* The "Recommended use" identified for this product is provided solely to comply with a US Federal requirement and is not part of the seller's published specification. The terms of this Safety Data Sheet (SDS) do not create or infer any warranty, express or implied, including by incorporation into or reference in the seller's sales agreement.

Details of the supplier of the safety data sheet

Company:

BASF CORPORATION

100 Park Avenue

Florham Park, NJ 07932, USA

Telephone: +1 973 245-6000

Emergency telephone number

CHEMTREC: 1-800-424-9300

BASF HOTLINE: 1-800-832-HELP (4357)

Other means of identification

2. Hazards Identification

According to Regulation 2012 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

Classification of the product

Flam. Liq.	3	Flammable liquid
Met. Corr.	1	Substance or mixture corrosive to metals
Acute Tox.	4 (oral)	Acute toxicity
Acute Tox.	3 (dermal)	Acute toxicity
Skin Corr./Irrit.	1B	Skin corrosion/irritation
Eye Dam./Irrit.	1	Serious eye damage/eye irritation
Repr.	2 (fertility)	Reproductive toxicity
Aquatic Acute	3	Hazardous to the aquatic environment - acute

Label elements

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Pictogram:



Signal Word:
Danger

Hazard Statement:

H226	Flammable liquid and vapour.
H290	May be corrosive to metals.
H311	Toxic in contact with skin.
H302	Harmful if swallowed.
H361	Suspected of damaging fertility.
H314	Causes severe skin burns and eye damage.
H402	Harmful to aquatic life.

Precautionary Statements (Prevention):

P280	Wear protective gloves/protective clothing/eye protection/face protection.
P210	Keep away from heat/sparks/open flames/hot surfaces. – No smoking.
P243	Take precautionary measures against static discharge.
P260	Do not breathe dust or mist.
P273	Avoid release to the environment.
P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P241	Use explosion-proof electrical/ventilating/lighting/equipment.
P270	Do not eat, drink or smoke when using this product.
P264	Wash with plenty of water and soap thoroughly after handling.
P233	Keep container tightly closed.
P234	Keep only in original container.
P242	Use only non-sparking tools.
P240	Ground/bond container and receiving equipment.

Precautionary Statements (Response):

P310	Immediately call a POISON CENTER or doctor/physician.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P303 + P361 + P352	IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Wash with plenty of soap and water.
P304 + P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P303 + P361 + P353	IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P301 + P330 + P331	IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
P390	Absorb spillage to prevent material damage.
P370 + P378	In case of fire: Use water spray, dry powder, foam or carbon dioxide for extinction.

Precautionary Statements (Storage):

P405	Store locked up.
P406	Store in corrosive resistant/... container with a resistant inner liner.
P403 + P235	Store in a well-ventilated place. Keep cool.

Precautionary Statements (Disposal):

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P501 Dispose of contents/container to hazardous or special waste collection point.

Hazards not otherwise classified

If applicable information is provided in this section on other hazards which do not result in classification but which may contribute to the overall hazards of the substance or mixture.

According to Regulation 1994 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

Emergency overview

DANGER:
CORROSIVE.
FLAMMABLE LIQUID.
Harmful by inhalation, in contact with skin and if swallowed.
Corrosive to the skin, eyes and respiratory system.
Causes burns.
RISK OF SERIOUS DAMAGE TO EYES.
SENSITIZER.
Eye wash fountains and safety showers must be easily accessible.
Wear NIOSH-certified chemical goggles.
Wear chemical resistant protective gloves.
Wear full face shield if splashing hazard exists.
Avoid contact with the skin, eyes and clothing.
Wear protective clothing.
Wear a NIOSH-certified (or equivalent) organic vapour respirator.

3. Composition / Information on Ingredients

According to Regulation 2012 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

<u>CAS Number</u>	<u>Content (W/W)</u>	<u>Chemical name</u>
108-91-8	>= 75.0 - <= 100.0 %	cyclohexylamine

According to Regulation 1994 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

<u>CAS Number</u>	<u>Content (W/W)</u>	<u>Chemical name</u>
108-91-8	>= 99.5 %	cyclohexylamine
7732-18-5	<= 0.3 %	Water

4. First-Aid Measures

Description of first aid measures

General advice:

Remove contaminated clothing.

If inhaled:

Keep patient calm, remove to fresh air, seek medical attention. Immediately administer a corticosteroid from a controlled/metered dose inhaler.

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If on skin:

Immediately wash thoroughly with plenty of water, apply sterile dressings, consult a skin specialist.

If in eyes:

Immediately wash affected eyes for at least 15 minutes under running water with eyelids held open, consult an eye specialist.

If swallowed:

Immediately rinse mouth and then drink 200-300 ml of water, seek medical attention.

Most important symptoms and effects, both acute and delayed

Symptoms: The most important known symptoms and effects are described in the labelling (see section 2) and/or in section 11., Further symptoms are possible

Indication of any immediate medical attention and special treatment needed

Note to physician

Treatment: Treat according to symptoms (decontamination, vital functions), no known specific antidote. Pulmonary odema prophylaxis. Medical monitoring for at least 24 hours.

5. Fire-Fighting Measures

Extinguishing media

Suitable extinguishing media:
water spray, dry powder, foam, carbon dioxide

Special hazards arising from the substance or mixture

Hazards during fire-fighting:
nitrogen oxides, carbon oxides
The substances/groups of substances mentioned can be released in case of fire. Under certain conditions in case of fire other hazardous combustion products may be generated.

Advice for fire-fighters

Protective equipment for fire-fighting:
Wear self-contained breathing apparatus and chemical-protective clothing.

Further information:

Dispose of fire debris and contaminated extinguishing water in accordance with official regulations.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Extinguish sources of ignition nearby and downwind. Wind direction should be noted. Wear suitable personal protective clothing and equipment. Ensure adequate ventilation.

Environmental precautions

This product is regulated by RCRA. Do not discharge into drains/surface waters/groundwater.

Methods and material for containment and cleaning up

For small amounts: Pick up with suitable appliance and dispose of.

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For large amounts: Pick up with suitable appliance and dispose of.

7. Handling and Storage

Precautions for safe handling

Ensure thorough ventilation of stores and work areas.

Protection against fire and explosion:

Prevent electrostatic charge - sources of ignition should be kept well clear - fire extinguishers should be kept handy.

Conditions for safe storage, including any incompatibilities

Segregate from acids and acid forming substances.

Suitable materials for containers: Stainless steel

8. Exposure Controls/Personal Protection

Personal protective equipment

Respiratory protection:

Respiratory protection in case of vapour/aerosol release.

Hand protection:

Chemical resistant protective gloves

Use appropriate chemically resistant gloves as determined by an evaluation of glove performance characteristics and the hazards and potential hazards identified, including but not limited to butyl, natural and synthetic rubber, nitrile, or neoprene.

Eye protection:

Tightly fitting safety goggles (chemical goggles).

Body protection:

Body protection must be chosen depending on activity and possible exposure, e.g. apron, protecting boots, chemical-protection suit (according to EN 14605 in case of splashes or EN ISO 13982 in case of dust).

Body protection must be chosen depending on activity and possible exposure, e.g. head protection, apron, protective boots, chemical-protection suit.

General safety and hygiene measures:

Handle in accordance with good industrial hygiene and safety practice. Wearing of closed work clothing is required additionally to the stated personal protection equipment. When using, do not eat, drink or smoke. Hands and/or face should be washed before breaks and at the end of the shift. Gloves must be inspected regularly and prior to each use. Replace if necessary (e.g. pinhole leaks). Take off immediately all contaminated clothing. Wash contaminated clothing before reuse. Store work clothing separately.

9. Physical and Chemical Properties

Form: liquid
Odour: amine-like

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Colour:	colourless to pale yellow	
pH value:	11.5	(100 g/l, 20 °C)
Freezing point:	-18 °C	
Boiling point:	134 °C	(1,013 hPa) (other) Literature data.
Flash point:	27 °C	(Unspecified, closed cup) Literature data.
Lower explosion limit:	1.6 %(V)	
Upper explosion limit:	9.4 %(V)	
Autoignition:	265 °C	(DIN 51794)
Vapour pressure:	14 mbar	(20 °C)
Density:	0.867 g/cm3	(20 °C) (DIN 51757)
Partitioning coefficient n-octanol/water (log Pow):	1.2	(23 °C) (measured)
Self-ignition temperature:		not self-igniting
Viscosity, dynamic:	2.12 mPa.s	(20 °C)
Particle size:		The substance / product is marketed or used in a non solid or granular form.
Solubility in water:	1,000 g/l	(20 °C) miscible
Molar mass:	99.18 g/mol	
Evaporation rate:		Value can be approximated from Henry's Law Constant or vapor pressure.

10. Stability and Reactivity

Reactivity

No hazardous reactions if stored and handled as prescribed/indicated.

Corrosion to metals:

Corrosive effects to metal are not anticipated.

Oxidizing properties:

Based on its structural properties the product is not classified as oxidizing.

Chemical stability

The product is stable if stored and handled as prescribed/indicated.

Possibility of hazardous reactions

Exothermic reaction.

Conditions to avoid

Avoid all sources of ignition: heat, sparks, open flame. Avoid electro-static charge.

Incompatible materials

acids

Hazardous decomposition products

Decomposition products:

Possible thermal decomposition products: carbon oxides, nitrogen oxides

11. Toxicological information

Primary routes of exposure

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Routes of entry for solids and liquids are ingestion and inhalation, but may include eye or skin contact. Routes of entry for gases include inhalation and eye contact. Skin contact may be a route of entry for liquefied gases.

Acute Toxicity/Effects

Acute toxicity

Assessment of acute toxicity: Of moderate toxicity after single ingestion. Of pronounced toxicity after short-term skin contact. Virtually nontoxic by inhalation. The inhalation of a highly enriched/saturated vapor-air-mixture represents an acute hazard.

Oral

Type of value: LD50

Species: rat

Value: 303 mg/kg (BASF-Test)

Inhalation

Type of value: LC50

Species: rat

Value: > 32.9 mg/l

Exposure time: 4 h

Literature data.

Species: rat

Value: (IRT)

Exposure time: 10 min

No Mortality within the stated exposition time as shown in animal studies, however, deaths occurred after longer exposure.

Dermal

Type of value: LD50

Species: rabbit

Value: > 631 - < 1,000 mg/kg

Literature data.

Irritation / corrosion

Assessment of irritating effects: Corrosive! Damages skin and eyes. May cause severe damage to the eyes.

Skin

Species: rabbit

Result: Corrosive.

Method: BASF-Test

Eye

Species: rabbit

Result: Risk of serious damage to eyes.

Method: BASF-Test

Chronic Toxicity/Effects

Genetic toxicity

Assessment of mutagenicity: Most of the results from the available studies show no evidence of a mutagenic effect.

Carcinogenicity

Assessment of carcinogenicity: In long-term studies in rats and mice in which the substance was given by feed, a carcinogenic effect was not observed. Literature data.

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Reproductive toxicity

Assessment of reproduction toxicity: On the basis of animal study findings, an effect on fertility cannot be excluded when given in high doses. Literature data.

Teratogenicity

Assessment of teratogenicity: The substance did not cause malformations in animal studies. When given in high doses embryotoxicity was observed. Literature data.

Symptoms of Exposure

The most important known symptoms and effects are described in the labelling (see section 2) and/or in section 11., Further symptoms are possible

12. Ecological Information

Toxicity

Aquatic toxicity

Assessment of aquatic toxicity:

Acutely harmful for aquatic organisms. The inhibition of the degradation activity of activated sludge is not anticipated when introduced to biological treatment plants in appropriate low concentrations.

Toxicity to fish

LC50 (96 h) 44 mg/l, *Oncorhynchus mykiss* (static)

The details of the toxic effect relate to the nominal concentration. The study was carried out in soft water. Literature data.

Aquatic invertebrates

EC50 (24 h) 49 mg/l, *Daphnia magna* (DIN 38412 Part 11, static)

The details of the toxic effect relate to the nominal concentration. Literature data.

Aquatic plants

EC50 (96 h) 20 mg/l (growth rate), *Selenastrum capricornutum* (static)

Literature data.

Microorganisms/Effect on activated sludge

Toxicity to microorganisms

OECD Guideline 209 static

activated sludge, domestic/EC50 (3 h): 870 mg/l

Literature data. The details of the toxic effect relate to the nominal concentration.

Persistence and degradability

Assessment biodegradation and elimination (H₂O)

Readily biodegradable (according to OECD criteria). Literature data.

Elimination information

61.6 % BOD of the ThOD (14 d) (OECD 301C; ISO 9408; 92/69/EEC, C.4-F) (Inoculum conforming to MITI requirements (OECD 301C))

90 - 100 % BOD of the ThOD (20 d) (OECD 301D; EEC 92/69, C.4-E) (aerobic, activated sludge, domestic)

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Bioaccumulative potential

Assessment bioaccumulation potential

Because of the n-octanol/water distribution coefficient (log Pow) accumulation in organisms is not to be expected.

Mobility in soil

Assessment transport between environmental compartments

The substance will slowly evaporate into the atmosphere from the water surface.
Adsorption to solid soil phase is not expected.

Additional information

Sum parameter

Biochemical oxygen demand (BOD): 1,880 mg/g

Adsorbable organically-bound halogen (AOX):
This product contains no organically-bound halogen.

13. Disposal considerations

Waste disposal of substance:

Dispose of in accordance with national, state and local regulations.

Container disposal:

If containers are not empty, they must be disposed of in a RCRA-licensed facility. RCRA empty containers may be landfilled at a licensed facility; other containers must be disposed of in a RCRA licensed facility.

RCRA: D001

14. Transport Information

Land transport

USDOT

Hazard class:	8
Packing group:	II
ID number:	UN 2357
Hazard label:	8, 3
Proper shipping name:	CYCLOHEXYLAMINE

Sea transport

IMDG

Hazard class:	8
Packing group:	II
ID number:	UN 2357
Hazard label:	8, 3
Marine pollutant:	NO
Proper shipping name:	CYCLOHEXYLAMINE

Air transport

IATA/ICAO

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Hazard class: 8
Packing group: II
ID number: UN 2357
Hazard label: 8, 3
Proper shipping name: CYCLOHEXYLAMINE

15. Regulatory Information

Federal Regulations

Registration status:

Chemical TSCA, US released / listed

EPCRA 311/312 (Hazard categories): Acute; Chronic; Fire

<u>CERCLA RQ</u>	<u>CAS Number</u>	<u>Chemical name</u>
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0.1 mg/l
100 mg/kg
10 mg/kg
1 mg/l
1 LBS
1 LBS
1 LBS
10000 LBS
100 LBS
100 LBS
10000 LBS

State regulations

<u>State RTK</u>	<u>CAS Number</u>	<u>Chemical name</u>
MA, PA	108-91-8	cyclohexylamine

NFPA Hazard codes:

Health : 3 Fire: 3 Reactivity: 1 Special:

HMIS III rating

Health: 3[□] Flammability: 3 Physical hazard: 1

Assessment of the hazard classes according to UN GHS criteria (most recent version):

Aquatic Acute	3	Hazardous to the aquatic environment - acute
Skin Corr./Irrit.	1B	Skin corrosion/irritation
Acute Tox.	3 (dermal)	Acute toxicity
Acute Tox.	4 (oral)	Acute toxicity
Met. Corr.	1	Substance or mixture corrosive to metals
Repr.	2 (fertility)	Reproductive toxicity
Flam. Liq.	3	Flammable liquid
Eye Dam./Irrit.	1	Serious eye damage/eye irritation

16. Other Information

SDS Prepared by:

BASF NA Product Regulations

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We support worldwide Responsible Care® initiatives. We value the health and safety of our employees, customers, suppliers and neighbors, and the protection of the environment. Our commitment to Responsible Care is integral to conducting our business and operating our facilities in a safe and environmentally responsible fashion, supporting our customers and suppliers in ensuring the safe and environmentally sound handling of our products, and minimizing the impact of our operations on society and the environment during production, storage, transport, use and disposal of our products.

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