












Safety Data Sheet

24 hour Emergency Response No. +86-532-8027466



SECTION 1: PRODUCT AND COMPANY IDENTIFICATION											
Cyclohexylamine (CHA) 99.5%		Shandong IRO Water Treatment Co.,Ltd Mushi Town, Tengzhou, Zaozhuang, China									
PRODUCT USE: Water Treatment Application Formulation		IRO phone: +86-532-8027466									
Personal Protection Equipment	GHS Pictograph	DOT Symbol(s)	HMIS (See last page for guide to HMIS)								
 Safety Glasses  Vapor Respirator  Gloves  Protective Apron		IMO/ IMDG/ US DOT: UN 2357 Cyclohexylamine Class: 8 PG:II	<table border="1"> <tr> <td>HEALTH</td> <td>3</td> </tr> <tr> <td>FLAMMABILITY</td> <td>3</td> </tr> <tr> <td>PHYSICAL HAZARD</td> <td>1</td> </tr> <tr> <td>PERSONAL PROTECTION</td> <td>F</td> </tr> </table>	HEALTH	3	FLAMMABILITY	3	PHYSICAL HAZARD	1	PERSONAL PROTECTION	F
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SECTION 2: HAZARDS IDENTIFICATION		
EMERGENCY OVERVIEW		
GHS CLASSIFICATION Signal Word Warning: DANGER CORROSIVE    	Hazard Statements H226 Flammable liquid & vapor. H290 May be corrosive to metals H302: Harmful if swallowed H311 Toxic in contact with skin H314: Causes severe skin burns and serious eye damage H318: Causes serious eye damage H402 Harmful to aquatic life	Precautionary Statements P102: Keep out of reach of children. P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P233: Keep container tightly closed. P262: Do not get in eyes, skin, clothing. P264: Wash thoroughly after handling. P273: Avoid release to environment P281: Use PPE as required P310: Immediately call doctor if serious eye/skin damage develops
RESPONSE: See section 4: FIRST AID MEASURES. Also, see below: <ul style="list-style-type: none"> • P202: Do not handle until all safety precautions have been read and understood. • P270: Do not eat, drink or smoke when using this product. • P 280: Wear gloves, eye protection and face protection (as needed to prevent skin and eye contact. Wash hands or liquid-contacted skin thoroughly after handling.) • P310: Immediately call a POISON CENTER or doctor/physician • P338: If in eyes, rinse cautiously with water for several minutes. Remove contact lenses. • P370 + P378: In case of fire: Use water spray, dry powder, foam or carbon dioxide for extinction 		
STORAGE: Store in a well ventilated place. Keep cool. Store locked up. Keep container tightly closed. Use only approved containers.		
DISPOSAL: Dispose of contents/containers to approved disposal site in accordance with local, regional, and/or international regulations.		



Safety Data Sheet

24 hour Emergency Response No. +86-532-8027466



SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

COMPONENT	CAS No.	PURITY %
Cyclohexylamine (1-aminocyclohexane)	108-91-8	99.5%

SECTION 4: FIRST-AID MEASURES

Inhalation: If inhaled, remove to fresh air. Keep warm and at rest.

Skin contact: In case of contact, immediately flush skin with plenty of water. Consult a skin specialist.

Eye contact: Remove contact lenses. Rinse immediately with plenty of water, also under the eyelids for at least 15 minutes. Consult a skin specialist.

Ingestion: Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Obtain medical attention.

Most important symptoms and effects, both acute and delayed.

Symptoms: The most important known symptoms and effects are described in the labeling (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 for treatment: Treat according to symptoms (decontamination, vital functions), no known specific antidote. Pulmonary odema prophylaxis. Medical monitoring for at least 24 hours.

SECTION 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: If fumes are present wear an OSHA/NIOSH approved full-face respirator with self-contained breathing apparatus (SCBA). Dispose of fire debris and contaminated extinguishing water in accordance with official regulations.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Small Spill: Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill: Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system.

Environmental Precautions: This product is regulated by RCRA. Do not discharge spilled material or runoff into drains/surface waters/groundwater. Avoid contact with soil, waterways, drains and sewers.



Safety Data Sheet

24 hour Emergency Response No. +86-532-8027466



SECTION 7: HANDLING AND STORAGE

Precautions: Use appropriate personal protective equipment. Handle only in a well-ventilated area. Handle in a manner consistent with good industrial/manufacturing techniques and practices. Wash hands thoroughly with soap and water after use. In case of insufficient ventilation, wear suitable respiratory equipment. If you feel unwell, seek medical attention and show the label when possible. Avoid contact with skin and eyes.

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. Keep container tightly closed. Keep container in a cool, well-ventilated area.

Suitable materials for containers: Carbon steel (Iron)

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION EQUIPMENT (PPE)

Components with occupational exposure limits:

Cyclohexylamine	OSHA PEL	TWA value 10 ppm 40 mg/M ³
	ACGIH TLV	TWA value 10 ppm

Engineering Controls: Special ventilation requirements. As this product contains ingredients with exposure limits, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure below any recommended or statutory limits.

Personal Protection:

- **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:** This 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. Also, use Lab coat.
- **Breathing:** Be sure to use an approved/certified respirator or equivalent.

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.

Personal Protection in Case of a Large Spill: Splash goggles. Full suit. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits: Not available.



Safety Data Sheet

24 hour Emergency Response No. +86-532-8027466



SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Physical state and appearance:	Liquid
Odor:	Amine, fish-like
Purity:	99.5%
Molecular Weight:	99.18 g/mole (100%)
Color:	Colorless to very pale yellow transparent
pH	11.5 approx.
Freezing Point:	-18°C
Boiling Point:	134.5°C
Flash Point:	28.6°C (Unspecified closed cup)
Self-ignition temperature:	Not self-igniting
Lower explosion limit:	1.6% (V/V)
Solubility:	Soluble
Relative Density:	0.864 @ 25°C (Water is approx 1.0)
Refractive Index:	1.4585

NOTE: the physical data above are typical values and should not be construed as a specification.

SECTION 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: Possible thermal decomposition products: carbon oxides, nitrogen oxides

SECTION 11: TOXICOLOGICAL INFORMATION

Toxicological information on this product or its components appears in this section when such data is available.

Routes of Entry/Exposure: 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 (Literature data).



Safety Data Sheet

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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 (Literature data).
- **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.
- **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).
- **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.)



Safety Data Sheet

24 hour Emergency Response No. +86-532-8027466



SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicological information on this product or its components appears in this section when such data is available.

Ecotoxicity: May cause long-term adverse effects in the aquatic environment, as 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.

Mobility in soil: Assessment transport between environmental compartments The substance will slowly evaporate into the atmosphere from the water surface.

Additional information: Biochemical oxygen demand (BOD): 1,880 mg/g
All work practices must be aimed at eliminating environmental contamination.

SECTION 13: DISPOSAL

Environmental precautions: CAUTION: Keep spills and cleaning runoff out of municipal sewers and open bodies of water.

Waste Disposal: Review federal, state and local government requirements prior to disposal.

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.

SECTION 14: TRANSPORT INFORMATION

Land transport (US DOT):

Hazard class: 8

Packing group: II

ID number: UN 2357

Hazard label: 8, 3

Proper shipping name: CYCLOHEXYLAMINE



Air transport (IATA/ICAO):

All as above

Sea transport (IMDG):

All as above

Marine pollutant: NO

Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations.



Safety Data Sheet

24 hour Emergency Response No. +86-532-8027466



SECTION 15: REGULATORY INFORMATION

Federal Regulations:

Registration status:

Chemical TSCA, US released / listed

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

CERCLA RQ	CAS Number	Chemical name
100 LBS	108-91-8	cyclohexylamine

State regulations:

State RTK	CAS Number	Chemical name
NJ	108-91-8	cyclohexylamine
PA	108-91-8	cyclohexylamine

NFPA Hazard codes:

Health : 3 Fire: 3 Reactivity: 1 Special:

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	Corrosive to metals
Repr.(OSHA):	2 (fertility)	Reproductive toxicity
Flam. Liq.:	3	Flammable liquids
Eye Dam./Irrit.:	1	Serious eye damage/eye irritation

The following statutes, regulations and standards have the related prescribes on chemicals in terms of safe use, storage, transportation, loading and unloading, classification and symbol S, etc.

- Provisions on the Environmental Administration of New Chemical Substances.
- The Regulation on Chemicals Safe Use at Working Site
- Law on Prevention and Control of Environmental Pollution Caused by Solid Waste.
- Occupational Exposure Limits for Hazardous Agent in The workshop Chemical Hazardous Agents (GBZ 2.1).

China. Inventory of Existing Chemical Substances in China (IECSC):

All intentional components are listed on the inventory, are exempt, or are supplier certified

U.S. Federal and State Regulations: TSCA 8(b) inventory: Totyltriazole

WHMIS (Canada): Not controlled under WHMIS (Canada).

HCS Classification: May be harmful if swallowed.



Safety Data Sheet

24 hour Emergency Response No. +86-532-8027466



SECTION 16: OTHER INFORMATION

Further information: The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Information Source and References: This SDS is prepared by IRO Specialty Chem. USA, Inc. from information supplied by internal references within our company

Shandong IRO Water Treatment Co. Ltd., Shandong Province, China: Urges each customer or recipient of this SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given.

Regulatory requirements: These are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer, specific SDSs, we are not and cannot be responsible for SDSs obtained from any source other than ourselves. If you have obtained an SDS from another source or if you are not sure that the SDS you have is current, please contact us for the most current version. Contact us at: <https://www.irowater.com>

Date of production of SDS: 9/27/2017:

Author: C Frayne

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM																									
HAZARD INDEX	PERSONAL PROTECTION INDEX																								
4 = SEVERE HAZARD 3 = SERIOUS HAZARD 2 = MODERATE HAZARD 1 = SLIGHT HAZARD 0 = MINIMAL HAZARD	<table border="1"> <tr><td>A</td><td></td></tr> <tr><td>B</td><td></td></tr> <tr><td>C</td><td></td></tr> <tr><td>D</td><td></td></tr> <tr><td>E</td><td></td></tr> <tr><td>F</td><td></td></tr> <tr><td>G</td><td></td></tr> <tr><td>H</td><td></td></tr> <tr><td>I</td><td></td></tr> <tr><td>J</td><td></td></tr> <tr><td>K</td><td></td></tr> <tr><td>X</td><td>Consult your supervisor or S.O.P. for "SPECIAL" handling directions</td></tr> </table>	A		B		C		D		E		F		G		H		I		J		K		X	Consult your supervisor or S.O.P. for "SPECIAL" handling directions
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