

# MATERIAL SAFETY DATA SHEET

MSDS No. 01-05  
According to REACH Regulation no.1907/2006



## HYDROCHLORIC ACID, SOLUTION min. 32%

Revision: 6

Last up date: July 17, 2008

Date issued: July 21,1999

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**Class 8  
Corrosive substances**

**C**



**Corrosive**

### 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

#### 1.1. Identification of the substance/preparation

Trade Name	<b>Hydrochloric acid</b>
Chemical Name	Hydrochloric acid 32%, aqueous
Common Synonyms	Muriatic Acid, Hydrogen chloride,. aqueous

#### 1.2. Uses of the substance/preparation

Hydrochloric acid is used in the production of chlorides, for refining ore in the production of tin and tantalum, for pickling and cleaning of metal products, in electroplating, in removing scale from boilers, for the neutralization of basic systems, as a laboratory reagent, as a catalyst and solvent in organic syntheses, in the manufacture of fertilizers and dyes, for hydrolyzing starch and proteins in the preparation of various food products, and in the textile and rubber industries.

#### 1.3. Company/undertaking identification

##### **OLTCHIM S.A.**

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Telephone	+40/250/701200
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e-mail	oltchim @oltchim.ro

**1.4. Emergency telephone number +40 / (0)250/738141**

## 2. HAZARD IDENTIFICATION

**EC Classification according to Directive 67/548/CEE, Annex I** **C; R35**

**Corrosive, fuming liquid.**

**Causes burns.irritating to respiratory system.**

**Health effects:** CORROSIVE! Contact can cause severe skin and eye burns, leading to permanent damage with loss of light. Breathing the vapors can irritate the mouth, nose, and throat. High levels may irritate the lungs, causing coughing and/or shortness of breath. Higher exposure can cause a buildup of fluid of the lungs (pulmonary edema), a medical emergency. Overexposure may cause erosion of the teeth.

**Environmental effects:** Considering its high water solubility, hydrochloric acid is not expected to bioaccumulate in organism. Hydrochloric acid is slightly toxic in the aquatic environment. The toxic effect on aquatic organism is due pH decreasing. When released into the soil this material may leach into groundwater. During movement through soil, the carbonates will be decomposed and neutralized by hydrochloric acid. Hydrochloric acid is not classified as dangerous for environmental as specified in Directive 67/548/EEC, Annex I.

**Emergency Overview:** Colorless or slight yellow liquid with sharp, pungent odor, fume in air, very corrosive. Reacts with most metals in a corrosive manner liberating flammable hydrogen gas, (explosive limits in air: 4 - 75%). Will not burn in fire, but may generate chlorine fume.

## 3. COMPOSITION/ INFORMATION ON INGREDIENTS

Hazardous components /constituents	Concentration % (v/v)	CAS No.	EC No.	Annex I Index No.	Hazard Symbol	Risk phrases
Hydrogen Chloride	Min. 32	-	231-595-7	017-002-01-X	C	R 34 R 37

## 4. FIRST - AID MEASURES

*Seek medical attention immediately in all cases of exposure!*

**Inhalation:** Inhalation of hydrochloric acid at irritating concentrations causes coughing, pain, inflammation, and edema of the upper respiratory tract. At high concentration, the gas causes necrosis of the bronchial epithelium, constriction of the larynx and bronchi, and closure of the glottis. Concentrations of the 1000 to 2000 ppm and higher are immediately dangerous.

Remove from exposure area to fresh air. If not breathing, clear airway and start artificial resuscitation. Get immediate medical attention. If victim is having trouble breathing, transport to medical care and, if available, give supplemental oxygen. Keep the patient under medical observation for a least 24 hours.

**Skin contact:** Corrosive. Exposure to hydrochloric acid can produce burns on the skin and mucous membranes, the severity of which is related to the concentration of the solution. Subsequently, ulceration may occur, followed by keloid and retractile scarring.

Immediately flush skin with plenty of water for at least 15 minutes, while removing contaminated clothing and shoes. Get immediate medical attention. Wash clothing and contaminated shoes before reuse.

**Eyes contact:** Contact of conc acid with the eye can cause extensive necrosis of the conjunctiva and corneal epithelium, resulting in perforation or opaque scarring. Frequent contact with aqueous solutions of hydrochloric acid may lead to dermatitis. Flush contaminated eye(s) with plenty of water for at least 15 minutes. Remove any contact lenses. Hold eyelids apart to ensure rinsing of the entire surface of the eyes and lids with water. If physician is not available, flush for an additional 15 minutes. Get immediate medical attention.

**Ingestion:** Corrosive. Symptoms after ingestion include immediate pain and ulceration of all membranes and tissues which come in contact with the acid. Ingestion may be associated with nausea, vomiting and intense thirst; corrosion of the stomach may lead within a few hours or a few days to gastric perforation and peritonitis. Late esophageal, gastric and pyloric strictures and stenoses should be anticipated. If any acid is swallowed, it should be neutralized by gastric lavage with 5%  $\text{Na}_2\text{CO}_3$  solution, followed by a drop of aluminum hydroxide. **DO NOT INDUCE VOMITING!** Do not give anything by mouth to an unconscious or convulsing person. Get immediate medical attention.

**General advice:** Hydrochloric acid it is very corrosive and irritating and may cause severe burns and may be fatal if swallowed or inhaled. Do not get in eyes, or skin, on clothing! Do not breathe vapor! Keep in tightly closed containers.

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## 5. FIRE - FIGHTING MEASURES

**Extinguishing media:** For small fires, use water spray, foam, carbon dioxide or dry chemical. For large fires, use water spray, fog or alcohol foam.

**Protection of fire fighting:** Fire fighters should wear full protective clothing and self-contained breathing apparatus with face-piece operate in positive pressure mode. Stay away from ends of tanks. Cool tanks with water spray. Do not get water inside containers.

**Hazardous combustion products:** None.

**Other information:** Hydrochloric acid is nonflammable, has not sensibility to mechanical shock and to static discharge. Contact with metals produces hydrogen gas, which may form explosive mixtures with air. Thermal decomposition can produce poisoning chlorine. Hydrochloric acid reacts also with many organic materials with liberation of heat.

## 6. ACCIDENTAL RELEASE MEASURES

**Personal precautions:** Wear appropriate protective equipment. Do not touch or walk through spilled material. Stop leak if it can be done without risk. Evacuate all unnecessary personnel from affected area. Ventilate and isolate the hazard area.

**Environmental precautions:** Prevent from contamination the ground and the surface water by isolating the work area. Contain and recover liquid when possible. Keep closed containers and dispose according to all applicable federal state or local environment regulations.

**Methods of cleaning up:** For small spills, use vermiculite, fuller's earth or sand to absorb the liquid. Neutralize with lime stone, slaked lime or soda ash. Shovel up and place in a non-metal waste container for disposal. Neutralize spill area and wash with plenty of water. For large spills, dike spill area with soil or sandbags to contain it and to prevent it spread. Prevent liquid from entering sewers waterways; water spray can be used to knock down vapors. Remove bulk of liquid, for example with vacuum truck, for recovery or disposal. Then flush area with water and neutralize washings with lime stone, slaked lime, soda ash or caustic. If permitted, flush neutralized washing to a waste treatment plant. Dispose of all contaminants according to federal, state and local regulations.

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## 7. HANDLING AND STORAGE

**Handling:** Protect containers against physical damage. Wear appropriate protective equipment. Keep containers closed. Use with sufficient ventilation to keep area below established exposure levels. Wash thoroughly after handling. When handle hydrochloric acid avoid contact with metals and organic matters. When diluting, the acid should always be added slowly to water and in small amounts. Never use hot water and never add water to the acid! Water added to the acid can cause uncontrolled boiling and splashing. If opening metal containers, use non-sparking tools because of the possibility of hydrogen gas being present. Containers of this material may be hazardous when empty since they retain product residue (vapors, liquid); observe all warnings and precautions listed for the product

**Storage:** Store in a cool, dry, ventilated area with acid resistant floors and good drainage. Keep out of direct sunlight and away from heat, water and incompatible materials. Keep the containers tightly closed. Containers for hydrochloric acid must be made from corrosion resistant materials: glass, polyethylene, polypropylene, polyvinyl chloride, carbon steel lined with rubber or ebonite.

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## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

**Exposure limit:**

Long-term exposure limit (8-hour TWA reference period) for aerosol mist: 1 ppm (2 mg/m<sup>3</sup>)

Short-term exposure limit (15-minute reference period): 5 ppm (8 mg/m<sup>3</sup>)

**Engineering control:** Use local exhaust or general dilution ventilation system to keep employee exposure as low as possible. In plant operations should employ negative pressure (vacuum) techniques to keep vapor inside processing equipment.

### Personal protective equipment

**Respiratory protection:** If the exposure limit is exceeded (up to 50ppm) a full face-piece respirator with a chemical cartridge respirator with acid cartridge is recommended. Above this level, a self-contained breathing apparatus is advised.

**Hand protection:** Wear natural rubber, neoprene, chlorinated polyethylene or polyvinyl chloride gloves.

**Eye / Face protection:** Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

**Skin protection:** Wear clothing (full suit) that will protect the skin from exposure to this chemical. During emergency or while making repairs, wear clothing that will not allow this chemical to penetrate. An additional protection including impervious boots, apron or coverall, is needed in areas of unusual exposure to prevent skin contact.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	clear, colorless or slightly yellow fuming liquid
Odor	pungent odor
Boiling point	-84 <sup>0</sup> C
Melting point	-112 <sup>0</sup> C
Freezing point	-17.17 <sup>0</sup> C for 10.1% solution -46.2 <sup>0</sup> C for 31.4% solution
Density (water=1)	1.19
Vapor density (air=1)	1.257
Vapor pressure	19 mmHg, at 25 <sup>0</sup> C
Solubility in water	823 g/l at 0 <sup>0</sup> C; 721g/l at 20 <sup>0</sup> C; 561 g/l at 60 <sup>0</sup> C
Other solubility's	soluble in alcohol, benzene and ether, insoluble in hydrocarbons
pH	1N(0.1); 0.1N(.,1); 0.01N(2.021); 0.001N(3.021) 0,0001N(4.01).
Odor threshold	0.1 at 5ppm
Partition coefficient, log K <sub>ow</sub>	0.25
Flash point	non applicable
Auto ignition temperature	non applicable
Explosive properties	not explosive
Oxidizing properties	no oxidizing properties

## 10. STABILITY AND REACTIVITY

**Chemical stability:** Stable under ordinary condition of use and storage.

**Conditions to avoid:** Heat, direct sunlight, contact with common metals, alkali metals.

**Materials to avoid:** Reacts with water yielding dense, acrid hydrochloric acid fumes. Contact with common metals produces highly flammable hydrogen which may form an explosive mixture with air. Reacts with oxidizers generating toxic chlorine gas; with cyanides or sulfides, producing toxic hydrogen cyanide or hydrogen sulphide gas .

**Hazardous decomposition products:** When heated to decomposition, emits hydrogen chloride fumes and will react with water or steam to produce heat and toxic and corrosive fumes. Thermal oxidative decomposition produces toxic chlorine fumes and explosive hydrogen gas.

**Hazardous polymerization:** Will not occur.

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## 11. TOXICOLOGICAL INFORMATION

### Animal toxicity data

LD <sub>50</sub> /Oral rat	700 mg/kg.
LD <sub>50</sub> /Oral rabbit	900 mg/kg.
LD <sub>50</sub> /Dermal mouse	1449 mg/kg
LD <sub>50</sub> /Dermal rabbit	> 5010 mg/kg
LC <sub>50</sub> /Inhalation rat	3124 ppm/hour
LC <sub>50</sub> /Inhalation mouse	108 ppm/ 30 minutes

### Acute toxicity

**Inhalation:** Short term exposures have been reported to induce transitory obstruction in the respiratory tract, which diminishes with repeated exposure, suggesting adaption. Corrosive and irritating to the upper and lower respiratory tract and all mucosal tissue. Symptoms include cough, labored breathing and excessive salivary and sputum formation. Excessive irritation of the lungs causes acute pneumonia and pulmonary edema, which could be fatal. Chemical pneumonia and pulmonary edema may result from exposure to the lower respiratory tract and deep lung.

WARNING! Anhydrous fumes are more harmful than mists.

**Skin contact:** Corrosive and irritating to the skin and all living tissue. Exposure to hydrochloric acid can produce burns on the skin and mucous membranes, the severity of which is related to the concentration of the solution. Subsequently, ulceration may occur, followed by keloid and retractile scarring.

**Eyes contact:** Contact of conc acid with the eye can cause extensive necrosis of the conjunctiva and corneal epithelium, resulting in perforation or opaque scarring. Chemical pneumonitis can be

expected after respiratory exposure to acid vapors or after tracheobronchial aspiration of ingested acid.

**Ingestion:** Ingestion is harmful and may be fatal; may cause severe burning of mouth and stomach. SYMPTOMATOLOGY (after ingestion ) 1) Corrosion of mucous membranes of mouth, throat, and esophagus, with immediate pain and dysphagia. The necrotic areas are at first grayish white but soon acquire a blackish discoloration and sometimes a shrunken or wrinkled texture; the process is described as a "coagulation necrosis." 2) Epigastric pain, which may be associated with nausea and the vomiting of mucoid and "coffee-ground" material. At times, gastric hemorrhage may be intense, and the vomitus then contains fresh blood. 3) Circulatory collapse with clammy skin, weak and rapid pulse, shallow respirations, and scanty urine. Circulatory shock is often the immediate cause of death. 4) Asphyxial death due to glottic edema. 5) Late esophageal, gastric and pyloric strictures and stenoses, which may require major surgical repair, should be anticipated.

**Chronic effects:** Chronic (long-term) occupational exposure to hydrochloric acid has been reported to cause gastritis, chronic bronchitis, dermatitis, and photosensitization in workers. Prolonged exposure to low concentrations may also cause dental discoloration and erosion. Some experimental evidence indicates hydrochloric acid may cause mutagenic, teratogenic and reproductive effects.

#### **CMR effects**

**Carcinogenicity:** No carcinogenicity effects are reported (literature data).

**Mutagenicity:** No information

**Teratogenicity and Embryotoxicity:** There is no human or animal information available.

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## **12. ECOTOXICOLOGICAL INFORMATION**

### **Aquatic toxicity data:**

Fish	<i>Leuciscus idus</i>	LC <sub>50</sub> =862 mg /l 48hours
	<i>Gambusia affinis</i>	LC <sub>50</sub> =282 mg/l/96hours
Daphnia	<i>Daphnia magna</i>	LC <sub>50</sub> =56mg/l/72hours/////

**Mobility:** Complet miscible with water. Rapidly hydrolyzes when exposed to water. Will exhibit extensive evaporation from soil surface. Upon transport through the soil, hydrochloric acid will dissolve some of the soil materials (especially those with carbonate bases) and the acid will neutralize to some degree.

**Persistence and degradability:** It is not expected to persist in the environmet.

**Bio accumulation potential:** Hydrochloric acid is not expected to bioaccumulate.

**Other adverse effects:** Toxic for aquatic organisms. Toxic effect on fish or plankton. Harmful effect due to pH shift. Damage to plant growth. Do not cause biological oxygen deficit. Harmful effect begin at plant =6 mg/l

Lethal for fish as from 25 mg/l

PBT assessment: Not applicable.

### 13. DISPOSAL CONSIDERATIONS

**Waste treatment:** Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to an approved waste facility. Any disposal practice must be in compliance with all local and national law and regulations. Do not dump into any sewers, on the ground, or into any body of water.

**Packaging treatment:** The empty packaging must be disposal according with all local, regional and national regulations.

### 14. TRANSPORT INFORMATION

Hydrochloric acid solution can be shipped according to transport regulations for dangerous goods, hazard class 8, Corrosive substance.

#### Transport labeling



Class 8  
Corrosive substances

#### RID/ADR

UN Number	1789
Proper shipping name	<b>Hydrochloric acid , aqueous</b>
Hazard class	8
Packing group	II
Classification code	C1

*Danger panel*      80/1789      (80 Hazard Identification No.)  
(1789 UN No.)

#### IMDG/IMO

UN No.	1789
Hazard class	8
Packing group	II
Proper shipping name	<b>Hydrochloric acid , aqueous</b>

EmS

F-A, S-B

**IATA/IT-ICAO**

Proper shipping name	<b>Hydrochloric acid , aqueous</b>
UN No.	1789
Hazard class	8
UN Packing Group	II
IATA Label	Corrosive
Packaging Note Passenger	809
Packaging Note Cargo	813
Max. Quantity Passenger	11
Max. Quantity Cargo	301

**15. REGULATORY INFORMATION**

Hydrochloric acid is classified and labelled under Directive 67/548/EEC, Annex I. This product is listed on EINCS.

<b>EC Classification</b>	EC Index No. 017-002-01-X
	C; R34
	Xi; R37

**EC Labeling**

EC label name	Hydrochloric acid
EC Number	231-595-7
<b>Hazard symbol</b>	<b>C - Corrosive</b>

<b>R- phrases</b>	R 34	Cause burns.
	R 37	Irritating to respiratory system.
<b>S- phrases</b>	S 26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advise.
	S 45	In case of accident or if you fell unwell, seek medical advice immediately (show the label whenever possible)

**16. OTHER INFORMATION****List of relevant R-phrases (see chapter 3)**

R34	Cause burns.
R 37	Irritating to respiratory system.

**Precautions to be taken in handling and storing:** Keep well ventilated the areas where hydrochloric acid is stored and handled.

**Work hygienic practices:** Avoid direct contact of substance with skin/eyes. Avoid the exposure of personnel with dermatological and respiratory affections.

**Interdictions:** **Do not drink or eat** in working area.

**Do not smoke** in or near working area.

**The use of open flame** in working areas is prohibited.

**Uses and Restrictions:** Advice in this document relates only to product as originally supplied. Other derivative chemicals will have different properties and hazard.

Chemical intermediate.for inorganic and organic synthesis.

**Hazardous reaction:** Heat generated upon dilution with water. Dilute only by adding to water with agitation. Do not add water to hydrochloric acid.

**MSDS Revisions:** This Material Safety Data Sheet is made in accordance to European Directive 91 and will replace the previous version 5 dated January 10, 2008.

**Revised information:**

TÜV mark for Quality-Environmental Integrated System was replaced with the new one, remited by TÜV Management GmbH.

Sources of key data uses to compile the data sheet:

EC Directive 67/548/EC resp. 99/45/EC as amended in each case.

EC Directive 2001/58/EC as amended in each case.

EC Directive 2000/39/EC as amended in each case.

National Threshold Limit Values of corresponding countries as amended in each case.

Transport regulations according to ADR, RID, IMDG, IATA as amended in each case.

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*This MSDS has been elaborated in accordance with Regulation (EC) No.1907/2006 REACH.The information contained here in is based on the present state of our knowledge. It characterizes the product with regard to the appropriate safety precautions. It does not represent a guarantee of the properties of the product.This MSDS cannot cover all possible situations which the user may experience during handling and processing. Each aspect of the user's operation should be examined to determine if, or where, additional precautions may be necessary. All health and safety information contained within this MSDS should be provided to the user's employees or customers.*