



Safety Data Sheet

Section 01 - Identification

Product Identifier	Muriatic Acid
Other Means of Identification	Aqueous hydrogen chloride, hydrochloric acid, hydrogen chloride, HCl, chlorohydric acid.
Product Use and Restrictions on Use	Acidizing (activation) of petroleum wells, scale removal, ore reduction, metal cleaning, pH adjustment, industrial acidizing, generation of chlorine dioxide, regeneration of ion exchange resins.
Initial Supplier Identifier	ClearTech Industries Inc. 1500 Quebec Avenue Saskatoon, SK. Canada S7K 1V7
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Section 02 - Hazard Identification

GHS-Classification

Skin Corrosion/Irritation	Category 1B
Serious Eye Damage/Irritation	Category 1
STOT-Single Exposure	Category 3

Physical Hazards

Corrosive to Metals	Category 1
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Danger

Hazards Statements

H290 – May be corrosive to metals
H314 – Causes severe skin burns and eye damage
H335 – May cause respiratory irritation

Pictograms



Precautionary Statements

P234 – Keep only in original container
P260 – Do not breathe mist, vapours or spray.
P264 – Wash hands thoroughly after handling.
P301 + P330 + P331 – IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353 – IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin.

P271 – Use only outdoors or in a well-ventilated area
 P280 – Wear protective gloves, protective clothing, eye protection, and face protection
 P390 – Absorb spillage to prevent material damage
 P363 – Wash contaminated clothing before reuse
 P305 + P351 + P338 – IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 P304 + P340 – IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
 P310 – Immediately call a POISON CENTER or doctor/physician.
 P405 – Store locked up
 P403 + P233 – Store in a well-ventilated place. Keep container tightly closed
 P501 – Dispose of contents/container in accordance with all federal, provincial, and/or local regulations including the Canadian Environmental Protection Act.

Section 03 - Composition / Information on Ingredients

Chemical Name	CAS Number	Weight %	Unique Identifiers
Hydrochloric Acid	7647-01-0	10-35%	
Water	7732-18-5	65-90%	

Section 04 - First Aid Measures

Inhalation	Remove victim to fresh air. Only give artificial respiration if breathing has stopped. If breathing is difficult, give oxygen. Seek medical attention.
Skin Contact / Absorption	Remove contaminated clothing. Wash affected area with lukewarm water for at least 30 minutes. If irritation persists, repeat flushing. Seek immediate medical attention. Double bag, seal, label and leave contaminated clothing, shoes and leather goods at the scene for safe disposal.
Eye Contact	Immediately flush the contaminated eye(s) with lukewarm, gently flowing water for at least 30 minutes, while holding the eyelid(s) open. If a contact lens is present, remove only if easy to do so. Neutral saline solution may be used as soon as it is available. Seek immediate medical attention.
Ingestion	NEVER give anything by mouth if victim is rapidly losing consciousness, is unconscious or convulsing. Have victim rinse mouth thoroughly with water. DO NOT INDUCE VOMITING. If vomiting occurs naturally, have victim rinse mouth with water again. Seek immediate medical attention.
Additional Information	This chemical is very toxic. Take proper precautions to ensure your own safety before assisting others. DO NOT allow victim to move about unnecessarily. Symptoms of pulmonary edema can be delayed up to 48 hours after exposure. NOTE: Any skin or eye contact will also involve significant inhalation exposure.

Section 05 - Fire Fighting Measures

Suitable Extinguishing Media	Extinguish fire using agent suitable for surrounding fire. Cool all affected containers with flooding quantities of water. Apply water from as far a distance as possible. Use water spray to knock-down vapours.
Unsuitable Extinguishing Media	Not Available
Specific Hazards Arising From the Chemical	Contact with common metals produces extremely flammable hydrogen gas. When heated or in a fire, toxic and corrosive hydrogen chloride gas is released. Hydrogen chloride is thermally stable up to approximately 1500°C (2732°F). Above this temperature, hydrogen chloride begins to dissociate into extremely flammable hydrogen gas and very toxic and corrosive chlorine gas.
Special Protective Equipment and Precautions for Fire-Fighters	Wear NIOSH-approved self-contained breathing apparatus and protective gear.

Section 06 - Accidental Release Measures

Personal Precautions / Protective Equipment / Emergency Procedures	Wear appropriate personal protective equipment. Ventilate area. Only enter area with PPE. Stop or reduce leak if safe to do so.
Environmental Precautions	Prevent product from entering sewers and waterways.
Methods and Materials for Containment and Cleaning Up	SMALL SPILLS: Contain and soak up spill with absorbent material which does not react with spilled chemical. Put material in suitable, covered, labeled containers. Flush area with water. Do not get water inside containers. Contaminated absorbent material may pose the same hazards as the spilled product. LARGE SPILLS: Contact fire and emergency services and supplier for advice.

Section 07 - Handling and Storage

Precautions for Safe Handling	This material is VERY TOXIC and CORROSIVE. Use proper equipment for lifting and transporting all containers. Use sensible industrial hygiene and housekeeping practices. Wash thoroughly after handling. Avoid all situations that could lead to harmful exposure.
Conditions for Safe Storage	Store in a cool, dry, well-ventilated area, out of direct sunlight and away from heat sources. Keep quantity stored as small as possible. Drums should be vented when received and then at least weekly to relieve internal pressure.
Incompatibilities	Metals, sodium, bases, formaldehyde, oxidizing agent, reducing agents, perchloric acid, sulfuric acid. Potassium permanganate, aldehydes, epoxides, fluorine, acetylides, borides, carbides, phosphide, silicides, hexalithium disilicide.

Section 08 - Exposure Controls and Personal Protection

Exposure Limit(s)

Component	Regulation	Type of Listing	Value
Hydrochloric Acid	ACGIH	TLV-C	2 ppm
	OSHA	PEL-T-C	5 ppm (7 mg/m ³)

Engineering Control(s)

Ventilation Requirements	Mechanical ventilation (dilution or local exhaust), process or personnel enclosure and control of process conditions must be provided in accordance with all fire codes and regulatory requirements. Supply sufficient replacement air to make up for air removed by exhaust systems.
Other	Emergency shower and eyewash must be available and tested in accordance with regulations and be in close proximity.

Protective Equipment

Eyes/Face	Chemical goggles, full-face shield, or a full-face respirator is to be worn at all times when product is handled. Contact lenses should not be worn; they may contribute to severe eye injury.
Hand Protection	Impervious gloves of chemically resistant material (rubber or PVC) should be worn at all times. Wash contaminated clothing and dry thoroughly before reuse.
Skin and Body Protection	Guidelines for hydrochloric acid, 37% RECOMMENDED (resistance to breakthrough longer than 8 hours): Butyl rubber, Neoprene rubber, Viton(TM), Viton(TM)/Butyl rubber, Barrier (PE/PA/PE), Trelchem(TM) HPS, Trelchem(TM) VPS, Tychem(TM) SL (Saranex(TM)), Tychem(TM) CPF 3,

Tychem(TM) F, Tychem(TM) BR/LV, Tychem(TM) Responder(TM), Tychem(TM) TK.
CAUTION, use for short periods only (resistance to breakthrough within 1 to 4 hours): Polyethylene
NOT RECOMMENDED for use (resistance to breakthrough less than 1 hour): Polyvinyl alcohol

Respiratory Protection

NIOSH/OSHA RECOMMENDATIONS FOR HYDROGEN CHLORIDE (GAS) CONCENTRATIONS IN AIR:

Up to 50 ppm: Chemical cartridge respirator with cartridge(s) to protect against hydrogen chloride; or gas mask with canister to protect against hydrogen chloride; or powered air-purifying respirator with cartridge(s) to protect against hydrogen chloride; or powered air-purifying respirator with cartridge(s) to protect against hydrogen chloride; or SAR; or full-facepiece SCBA. Above this level, a full face self-contained breathing apparatus is required.

NIOSH approved acid gas or organic vapour cartridge(s) are required. EMERGENCY OR PLANNED ENTRY INTO UNKNOWN CONCENTRATION OR IDLH CONDITIONS: Positive pressure, full-facepiece SCBA; or positive pressure, full-facepiece SAR with an auxiliary positive pressure SCBA.

ESCAPE: Gas mask with acid gas canister; or escape-type SCBA.

Thermal Hazards

Not Available

Section 09 - Physical and Chemical Properties

Appearance

Physical State	Fuming liquid
Colour	Colourless or slightly yellow
Odour	Pungent odour
Odour Threshold	1-5 ppm (detectable)

Property

pH	<1
Melting Point/Freezing Point	-35°C
Initial Boiling Point and Boiling Range	62-90°C
Flash Point	Not Applicable
Evaporation Rate	<1
Flammability	Non-flammable
Upper Flammable Limit	Not Applicable
Lower Flammable Limit	Not Applicable
Vapour Pressure (mm Hg, 20°C)	84 mmHg
Vapour Density (Air=1)	1.268 @ 20°C

Relative Density	Not Available
Solubility(ies)	Completely miscible
Partition Coefficient: n-octanol/water	Log P _{ow} = 0.3
Auto-ignition Temperature	Not Applicable
Decomposition Temperature	>1500°C
Viscosity	1.71-2.11 cSt
Explosive Properties	In contact with metals, explosive hydrogen gas may form.
Specific Gravity (Water=1)	1.023-1.198
% Volatiles by Volume	100%
Formula	HCl
Molecular Weight	34.46 g/mol

Section 10 - Stability and Reactivity

Reactivity	Contact with hypochlorites liberates chlorine gas. May react violently with incompatible substances. Large amounts of heat can be released when concentrated hydrochloric acid is mixed with water or with organic solvents.
Stability	Stable, heat and contamination could cause decomposition.
Possibility of Hazardous Reactions	Hazardous polymerization does not occur.
Conditions to Avoid	High temperatures. Incompatibles.
Incompatible Materials	Metals, sodium, bases, formaldehyde, oxidizing agent, reducing agents, perchloric acid, sulfuric acid. Potassium permanganate, aldehydes, epoxides, fluorine, acetylides, borides, carbides, phosphide, silicides, hexalithium disilicide.
Hazardous Decomposition Products	Contact with hypochlorites liberates chlorine gas. May react violently with incompatible substances. May release toxic and/or flammable gases such as hydrogen and phosphine gas. Considerable amounts of heat may be evolved.

Section 11 - Toxicological Information

Acute Toxicity

Component	Oral LD ₅₀	Dermal LD ₅₀	Inhalation LC ₅₀
Hydrochloric Acid (35%)	2,121 mg/kg (rat)	4390 mg/kg (mouse)	1106 ppm (guinea pig, 4hr)

Chronic Toxicity – Carcinogenicity

Component	IARC
Hydrochloric Acid	Not classifiable as a human carcinogen.

Skin Corrosion/Irritation	Corrosive. Contact may produce severe irritation or corrosive skin damage. Effects range from dermatitis, photo sensitization, redness, swelling, pain, permanent scarring, to death.
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Ingestion	Causes severe burns of the mouth, esophagus, and stomach, with consequent pain, nausea, vomiting, diarrhea, circulatory collapse, and possibly death.
Inhalation	Hydrochloric acid solutions can readily release high concentrations of hydrogen chloride gas, which is very toxic and corrosive and poses a serious inhalation hazard. Inhalation of even low concentrations is irritating and can cause coughing, pain, inflammation and swelling in the upper respiratory tract. A severe exposure can result in a potentially fatal accumulation of fluid in the lungs (pulmonary edema). Symptoms of pulmonary edema can be delayed for up to 24 or 48 hours after exposure.
Serious Eye Damage/Irritation	Hydrochloric acid is corrosive to the eyes. Low concentrations of vapour or mist can be irritating, causing redness. Concentrated vapour, mist or splashed liquid can cause severe irritation and damage, burns and permanent blindness.
Respiratory or Skin Sensitization	Hydrochloric acid is not considered an occupational respiratory or skin sensitizer.
Germ Cell Mutagenicity	The available evidence does not indicate that hydrochloric acid is a mutagen.
Reproductive Toxicity	The limited evidence available does not indicate that hydrochloric acid is a developmental toxin
STOT-Single Exposure	Hydrochloric acid solutions release hydrogen chloride, a corrosive gas. Causes respiratory irritation.
STOT-Repeated Exposure	Prolonged exposure can cause erosion and discolouration of teeth and chronic inflammation of nose, throat, and airways. In general, long-term skin contact with low concentrations of corrosive materials can cause dry, red, cracked skin (dermatitis).
Aspiration Hazard	Severe exposure can result in pulmonary edema and corrosion of tissues in the nose and throat.
Synergistic Materials	Not Available

Section 12 – Ecological Information

Ecotoxicity

Component	Toxicity to Algae	Toxicity to Fish	Toxicity to Daphnia and Other Aquatic Invertebrates
Hydrochloric Acid	EC ₅₀ (Green algae, 72hr): 0.0492 mg/L	LC ₅₀ (Cyprinus carpio, 96 hr): 4.92 mg/L	LC ₅₀ (Shrimp, 48hr): 100-300 ppm
Biodegradability	Not Applicable - hydrochloric acid disassociates in water.		
Bioaccumulation	Hydrogen chloride does not accumulate in the food chain.		
Mobility	Hydrogen chloride dissociates into chloride and hydronium ions in moist soil.		
Other Adverse Effects	Extremely toxic to aquatic life by lowering the pH below 5.5. Dissociates in water and will be neutralized by naturally occurring alkalinity and carbon dioxide. Acid will permeate soil, dissolving soil material and will be neutralized somewhat.		

Section 13 – Disposal Considerations

Waste From Residues/Unused Products	Dispose in accordance with all federal, provincial, and/or local regulations including the Canadian Environmental Protection Act.
Contaminated Packaging	Dispose in accordance with all federal, provincial, and/or local regulations including the Canadian Environmental Protection Act.

Section 14 – Transport Information

UN Number	UN1789
UN Proper Shipping Name	HYDROCHLORIC ACID
Transport Hazard Class(es)	8
Packaging Group	II

Environmental Hazards Not listed as a marine pollutant under Canadian TDG Regulations, schedule III.

Special Precautions Not Available

Transport in Bulk Not Available

Additional Information	<u>Packing Group</u>	<u>Limited Quantity Index</u>
	II	1 L
	III	5 L

TDG

Other Secure containers (full and/or empty) with suitable hold down devices during shipment and ensure all caps, valves, or closures are secured in the closed position.

TDG PRODUCT CLASSIFICATION: This product has been classified on the preparation date specified at section 14 of this MSDS / SDS, for transportation in accordance with the requirements of part 2 of the Transportation of Dangerous Goods Regulations. If applicable, testing and/or published test data regarding the classification of this product are listed in the references at section 16 of this MSDS / SDS.

Section 15 – Regulatory Information

NOTE: THE PRODUCT LISTED ON THIS SDS HAS BEEN CLASSIFIED IN ACCORDANCE WITH THE HAZARD CRITERIA OF THE CANADIAN CONTROLLED PRODUCTS REGULATIONS. THIS SDS CONTAINS ALL INFORMATION REQUIRED BY THOSE REGULATIONS.

NSF Certification..... Product is Kosher certified. Product is certified under NSF/ANSI Standard 60 for pH adjustment and as a descaler at a maximum dosage for the following:

Hydrochloric Acid 10%: 140 mg/L	Hydrochloric Acid 19%: 74 mg/L	Hydrochloric Acid 28%: 50 mg/L
Hydrochloric Acid 11%: 127 mg/L	Hydrochloric Acid 20%: 70 mg/L	Hydrochloric Acid 29%: 48 mg/L
Hydrochloric Acid 12%: 117 mg/L	Hydrochloric Acid 21%: 67 mg/L	Hydrochloric Acid 30%: 47 mg/L
Hydrochloric Acid 13%: 108 mg/L	Hydrochloric Acid 22%: 64 mg/L	Hydrochloric Acid 31%: 45 mg/L
Hydrochloric Acid 14%: 100 mg/L	Hydrochloric Acid 23%: 61 mg/L	Hydrochloric Acid 32%: 44 mg/L
Hydrochloric Acid 15%: 93 mg/L	Hydrochloric Acid 24%: 58 mg/L	Hydrochloric Acid 33%: 42 mg/L
Hydrochloric Acid 16%: 88 mg/L	Hydrochloric Acid 25%: 56 mg/L	Hydrochloric Acid 34%: 41 mg/L
Hydrochloric Acid 17%: 82 mg/L	Hydrochloric Acid 26%: 54 mg/L	Hydrochloric Acid 35%: 40 mg/L
Hydrochloric Acid 18%: 78 mg/L	Hydrochloric Acid 27%: 52 mg/L	

NSF product use restrictions based on requirements obtained from the NSF website for current requirements.

Section 16 – Other Information

Preparation Date July 18, 2016

Note: The responsibility to provide a safe workplace remains with the user. The user should consider the health hazards and safety information contained herein as a guide and should take those precautions required in an individual operation to instruct employees and develop work practice procedures for a safe work environment. The information contained herein is, to the best of our knowledge and belief, accurate. However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by the use of this material. It is the responsibility of the user to comply with all applicable laws and regulations.

Attention: Receiver of the chemical goods / SDS coordinator

As part of our commitment to the Canadian Association of Chemical Distributors (CACD) Responsible Distribution[®] initiative, ClearTech Industries Inc. and its associated companies require, as a condition of sale, that you forward the attached Safety Data Sheet(s) to all affected employees, customers, and end-users. ClearTech will send any available supplementary handling, health, and safety information to you at your request.

If you have any questions or concerns please call our customer service center.

References:

- 1) CHEMINFO
- 2) eChemPortal
- 3) TOXNET
- 4) Transportation of Dangerous Goods Canada
- 5) HSDB
- 6) ECHA

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