Material Safety Data Sheet (MSDS): HYDROCHLORIC ACID

Company Headquarters
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1. Product Identification

Synonyms: Muriatic acid; hydrogen chloride, aqueous
CAS No.: 7647-01-0
Molecular Weight (Hydrogen Chloride): 36.46
Chemical Formula: HCI

2. Composition/Information on Ingredients

Ingredient	CAS No.	Percent	Hazardous
Hydrogen Chloride	7647-01-0	31.5 -35.2%	Yes
Water	7732-18-5	64.8-68.5%	No

3. Hazards Identification

Emergency Overview

Poison! Danger! Corrosive! Liquid and mist cause severe burns to all body tissue. May be fatal if swallowed or inhaled. Inhalation may cause lung damage.

Potential Health Effects

Eye:
Corrosive! Vapor or mist may cause irritation and severe burns and permanent eye damage. May cause painful sensitization to light. May cause conjunctivitis.

Skin:
Corrosive! May be absorbed through the skin in harmful amounts. Contact with liquid is corrosive and causes severe burns and ulceration. May cause photosensitization in certain individuals.

Ingestion:
Corrosive! May cause circulatory system failure. Causes severe digestive tract burns with abdominal pain, vomiting, and possible death. May cause permanent tissue destruction of the esophagus and digestive tract.

Inhalation:
Corrosive! Causes severe irritation of upper respiratory tract with coughing, burns, breathing difficulty, and possible coma. May cause pulmonary edema and severe respiratory disturbances.

Chronic:
Prolonged or repeated skin contact may cause dermatitis. Repeated exposure may cause erosion of teeth. May cause conjunctivitis and photosensitization.

4. First Aid Measures

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

Skin:
Get medical attention immediately. Rinse area with large amounts of water for at least 15 minutes. Remove contaminated clothing and shoes.

Ingestion:
DO NOT INDUCE VOMITING. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical attention immediately.

Inhalation:
Remove to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

5. Fire Fighting Measures

General Information:
In the event of a fire, wear full protective clothing and NIOSH (approved or equivalent), and full protective gear. Not flammable, but reacts with most metals to form flammable hydrogen gas. Cool tanks with water spray until well after fire is out.

Fire and Explosion Hazards: May release toxic gases

Extinguishing Media: Use extinguishing agents appropriate for surrounding fires.

Fire Fighting: Keep unnecessary people away, isolate hazard area and deny entry. Wear NIOSH approved positive-pressure self-contained breathing apparatus. Move container from fire area if it can be done without risk. Avoid inhalation of material or combustion by-products, Stay upwind and keep out of low areas. Cool containers with water.

Hazardous Combustion Products:

Thermal decomposition products or combustion: hydrogen chloride

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in section 8. Isolate hazard area. Contain and recover liquid when possible. Neutralize with alkaline material (soda ash, lime), then absorb with an inert material (e.g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer. US regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities.
If release occurs in the U.S. and is reportable under CERCLA Section 103, notify the National Response Center at (800)424-8802 (USA) or (202)426-2675 (USA)

7. Handling and Storage

Handling:
Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Do not get on skin or in eyes. Do not ingest or inhale.

Storage:
Keep away from heat and flame. Keep out of direct sunlight. Store in a cool, dry, well-ventilated area away from incompatible substances.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
OSHA Permissible Exposure Limit (PEL): 5 ppm Ceiling
ACGIH Threshold Limit Value (TLV): 5 ppm Ceiling

Ventilation System:
Use closed systems when possible. Provide local exhaust ventilation where vapor or mist may be generated. Ensure compliance with applicable exposure limits.

Personal Protective Equipment

Eyes:
Wear appropriate protective eyeglasses or chemical safety goggles.
Skin:
Wear appropriate protective gloves to prevent skin exposure.
Clothing:
Wear appropriate protective clothing to prevent skin exposure.
Personal Respirators: (NIOSH Approved):
For emergencies or instances where the exposure levels are not known, use a full-face piece positive-pressure, air supplied respirator. **WARNING: Air purifying respirators do not protect workers in oxygen-deficient atmospheres.**

9. Physical and Chemical Properties (Hydrochloric Acid)

Physical State: liquid
Appearance: clear
Color: colorless
Odor: pungent odor
Molecular Weight: 36.46
Molecular Formula: HCI
Boiling Point: 140-221 F (60.0-105 C)
Freezing Point: -29 to 5 F (-34 to -15 C)
Vapor Pressure: 14.6-80 mmHg @ 20 C
Vapor Density: (air=1): 1.3 @ 20 C
Specific Gravity (water=1): 1.05-1.18
Bulk Density: 8.75-9.83 lbs/gal
Water Solubility: 100%
PH: 2 (.02% solution)
Volatility: 9-36% by volume
Odor Threshold: 0.3 ppm (causes of factory fatigue)
Evaporation Rate: <1.00 (butyl acetate=1)
Coefficient of water/oil distribution: Not available

10. Stability and Reactivity

Chemical Stability:
Stable under normal temperatures and pressures. Containers may burst when heated.

Hazardous Decomposition Products:
When heated to decomposition emits toxic 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.

Incompatibilities:
A strong mineral acid, concentrated hydrochloric acid is incompatible with many substances and highly reactive with strong bases, metals, metal oxides, hydroxides, amines, carbonates and other alkaline materials. Incompatible with materials such as cyanides, sulfides, sulfites and formaldehyde.

Conditions to Avoid:
Avoid heat, flames, sparks and other sources of ignition. Contact with water may produce a strong exothermic reaction with spattering. Contact with metals may evolve flammable hydrogen gas. Hydrogen chloride may react with cyanide, forming lethal concentrations of hydrocyanic acid.

11. Toxicological Information

Inhalation rat LC50: 3124 ppm/1H; oral rabbit LD50: 900mg/kg (Hydrochloric acid concentrated); investigated as a tumorigen, mutagen, reproductive effector.

Cancer Lists

Ingredient	Known	-NTP Carcinogen- Anticipated	IARC	Category
Hydrogen Chloride (7647-01-0	No	No		3
Water	No	No		None

12. Ecological Information

Environmental Fate:
When released into the soil, this material is not expected to be biodegrade. When released into the soil, this material may leak into groundwater.

Environmental Toxicity:
This material is expected to be toxic to aquatic life.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Reuse or reprocess if possible. Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D002

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: Hydrochloric Acid
UN/NA: UN1789
Hazard Class: 8
Packing Group: II
Information reported for product/size: 475LB

International (Water, I.M.O.)

Proper Shipping name: Hydrochloric Acid
UN/NA: UN1789
Hazard Class: 8
Packing Group: II
Information reported for product/size: 475LB

15. Regulatory Information

U.S. Regulations:

CERCLA sections 102a/103 hazardous substances (40 CFR 302.4):
Hydrogen Chloride (Hydrochloric Acid): 5000 LBS RQ (liquid)
Chlorine: 10 LBS RQ
Sara Title III Section 302 extremely hazardous substances (40 CFR 355.30):
Hydrogen Chloride (Hydrochloric Acid): 500LBS TPQ (gas)

Sara Title III section 311/312 hazardous categories (40 CFR 370.21):
Acute: Yes
Chronic: No
Fire: No
Reactive: No
Sudden Release: No

Sara Title III section 313 (40 CFR 372.65):
Hydrogen Chloride (Hydrochloric Acid): aerosol form only

This product contains a toxic chemical subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR 372. Refer to Section 3.

OSHA Process safety (29CFR1910.1190:
Hydrogen Chloride (Hydrochloric Acid): 5000 LBS TQ (gas)
Chlorine: 1500 LBS TQ

FDA: This material has Generally Recognized as Safe (GRAS) status under specific FDA regulations. Additional information is available from the Code of Federal Register (CFR) which is accessible on the FDA's website.

State Regulations:
California Proposition 65: This product may contain contaminants known to the State of California to cause cancer or reproductive toxicity as listed under Proposition 65 State Drinking Water and Toxic Enforcement Act. For additional information, contact Customer Service.

16. Other Information

NFPA Ratings:
Health: 3 Flammability: 0 Reactivity: 0

Label Hazard Warning:

POISON! DANGER! CORROSIVE LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED OR INHALED, INHALATION MAY CAUSE LUNG DAMAGE.

Label Precautions:

Do not get in eyes, on skin, or on clothing.
Do not breathe vapor or mist.
Use only with adequate ventilation.
Wash thoroughly after handling.
Store in a tightly closed container.
Remove and wash contaminated clothing promptly.

Label First Aid:

In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. If swallowed, **DO NOT INDUCE VOMITING** Give large quantities of water. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In all cases get medical attention immediately.

Product Use:

Chemical intermediate; oil & gas well acidizing; pH control; water treatment; steel pickling and metal cleaning; ore reduction; food processing.

Disclaimer:

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