

HYDROCHLORIC ACID

HCL

Common Synonyms Muriatic Acid	Watery liquid	Colorless	Sharp, irritating odor
Sinks and mixes with water. Irritating vapor is produced.			
<p>AVOID CONTACT WITH LIQUID AND VAPOR Keep people away. Wear chemical protective suit with self-contained breathing apparatus.</p> <p>Stop discharge if possible. Stay upwind and use water spray to "knock down" vapor. Isolate and remove discharged material. Notify local health and pollution control agencies.</p>			
Fire	<p>Not flammable. Flammable gas may be produced on contact with metals. Wear chemical protective suit with self-contained breathing apparatus.</p>		
Exposure	<p>CALL FOR MEDICAL AID</p> <p>VAPOR Irritating to eyes, nose and throat. If inhaled, will cause coughing or difficult breathing. Move to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen.</p> <p>LIQUID Will burn skin and eyes. Harmful if swallowed. Remove contaminated clothing and shoes. Flush affected areas with plenty of water. IF IN EYES, hold eyelids open and flush with plenty of water. IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk. DO NOT INDUCE VOMITING</p>		
Water Pollution	<p>Dangerous to aquatic life in high concentrations. May be dangerous if it enters water intakes. Notify local health and wildlife officials. Notify operators of nearby water intakes.</p>		
1. RESPONSE TO DISCHARGE (See Response Methods Handbook)		2. LABEL	
Issue warning-corrosive Restrict access Disperse and flush		2.1 Category: Corrosive 2.2 Class: 8	
3. CHEMICAL DESIGNATIONS		4. OBSERVABLE CHARACTERISTICS	
3.1 CG Competibility Class: Non-oxidizing mineral acid 3.2 Formula: HCl-H ₂ O 3.3 IMO/IUN Designation: 8.0/1789 3.4 DOT ID No.: 1789 3.5 CAS Registry No.: 7647-01-0		4.1 Physical State (as shipped): Liquid 4.2 Color: Colorless to light yellow 4.3 Odor: Pungent; sharp, pungent, irritating	
5. HEALTH HAZARDS			
5.1 Personal Protective Equipment: Self-contained breathing equipment, air-line mask, or industrial canister-type gas mask; rubber or rubber-coated gloves, apron, coat, overalls, shoes.			
5.2 Symptoms Following Exposure: Inhalation of fumes results in coughing and choking sensation, and irritation of nose and lungs. Liquid causes burns.			
5.3 Treatment of Exposure: INHALATION remove person to fresh air; keep him warm and quiet and get medical attention immediately; start artificial respiration if breathing stops. INGESTION : have person drink water or milk; do NOT induce vomiting. EYES : immediately flush with plenty of water for at least 15 min. and get medical attention; continue flushing for another 15 min. if physician does not arrive promptly. SKIN : immediately flush skin while removing contaminated clothing; get medical attention promptly; use soap and wash area for at least 15 min.			
5.4 Threshold Limit Value: 5 ppm			
5.5 Short Term Inhalation Limits: 5 ppm for 5 min.			
5.6 Toxicity by Ingestion: Data not available			
5.7 Late Toxicity: None			
5.8 Vapor (Gas) Irritant Characteristics: Vapor is moderately irritating such that personnel will not usually tolerate moderate or high vapor concentrations.			
5.9 Liquid or Solid Irritant Characteristics: Fairly severe skin irritant; may cause pain and second-degree burns after a few minutes' contact.			
5.10 Odor Threshold: 1-5 ppm			
5.11 IDLH Value: 100 ppm			

6. FIRE HAZARDS
6.1 Flash Point: Not flammable
6.2 Flammable Limits in Air: Not flammable
6.3 Fire Extinguishing Agents: Not pertinent
6.4 Fire Extinguishing Agents Not to be Used: Not pertinent
6.5 Special Hazards of Combustion Products: Toxic and irritating vapors are generated when heated.
6.6 Behavior in Fire: Not pertinent
6.7 Ignition Temperature: Not flammable
6.8 Electrical Hazard: Not pertinent
6.9 Burning Rate: Not flammable
6.10 Adiabatic Flame Temperature: Data not available
6.11 Stoichiometric Air to Fuel Ratio: Data not available
6.12 Flame Temperature: Data not available

7. CHEMICAL REACTIVITY
7.1 Reactivity With Water: No reaction
7.2 Reactivity with Common Materials: Corrosive to most metals with evolution of hydrogen gas, which may form explosive mixtures with air.
7.3 Stability During Transport: Stable
7.4 Neutralizing Agents for Acids and Caustics: Flush with water; apply powdered limestone, slaked lime, soda ash, or sodium bicarbonate.
7.5 Polymerization: Not pertinent
7.6 Inhibitor of Polymerization: Not pertinent
7.7 Molar Ratio (Reactant to Product): Data not available
7.8 Reactivity Group: 1

8. WATER POLLUTION
8.1 Aquatic Toxicity: 282 ppm/96 hr/mosquito fish/TL ₅₀ /fresh water 100-330 ppm/48 hr/shrimp/LC ₅₀ /salt water
8.2 Waterfowl Toxicity: Data not available
8.3 Biological Oxygen Demand (BOD): None
8.4 Food Chain Concentration Potential: None

9. SHIPPING INFORMATION
9.1 Grades of Purity: Food processing or technical: 18" Be-27.9%, 20 Be-31.5%, 22" Be-35.2%; Reagent, ACS, and USP: 23" Be-37.1%
9.2 Storage Temperature: Ambient
9.3 Inert Atmosphere: No requirement
9.4 Venting: Open

10. HAZARD ASSESSMENT CODE (See Hazard Assessment Handbook) A-P
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11. HAZARD CLASSIFICATIONS	
11.1 Code of Federal Regulations: Corrosive material	
11.2 NAS Hazard Rating for Bulk Water Transportation:	
Category	Rating
Fire	0
Health	3
Vapor Irritant	3
Liquid or Solid Irritant	3
Poisons	2
Water Pollution	2
Human Toxicity	2
Aquatic Toxicity	2
Aesthetic Effect	2
Reactivity	3
Other Chemicals	0
Water	0
Salt Reaction	0
11.3 NFPA Hazard Classification:	
Category	Classification
Health Hazard (Blue)	3
Flammability (Red)	0
Reactivity (Yellow)	0

12. PHYSICAL AND CHEMICAL PROPERTIES	
12.1 Physical State at 15°C and 1 atm: Liquid	
12.2 Molecular Weight: 36.46	
12.3 Boiling Point at 1 atm: 123°F = 50.5°C = 323.8°K	
12.4 Freezing Point: Not pertinent	
12.5 Critical Temperature: Not pertinent	
12.6 Critical Pressure: Not pertinent	
12.7 Specific Gravity: 1.19 at 20°C (liquid)	
12.8 Liquid Surface Tension: Not pertinent	
12.9 Liquid Water Interfacial Tension: Not pertinent	
12.10 Vapor (Gas) Specific Gravity: Not pertinent	
12.11 Ratio of Specific Heats of Vapor (Gas): Not pertinent	
12.12 Latent Heat of Vaporization: 178 Btu/lb = 98.6 cal/g = 4.13 X 10 ⁴ J/kg	
12.13 Heat of Combustion: Not pertinent	
12.14 Heat of Decomposition: Not pertinent	
12.15 Heat of Solution: -860 Btu/lb = -480 cal/g = -20 X 10 ⁴ J/kg	
12.16 Heat of Polymerization: Not pertinent	
12.25 Heat of Fusion: 13.0 cal/g	
12.26 Limiting Value: Data not available	
12.27 Reid Vapor Pressure: 8.0 psia	

NOTES

*Physical properties apply to 37 % solution.

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<p>Common Synonyms Muriatic Acid</p> <p>Watery liquid Colorless Sharp, irritating odor</p> <p>Sinks and mixes with water. Irritating vapor is produced.</p>	
<p>AVOID CONTACT WITH LIQUID AND VAPOR Keep people away Wear chemical protective suit with self-contained breathing apparatus Stop discharge if possible Stay upwind and use water spray to "knock down" vapor Isolate and remove discharged material. Notify local health and pollution control agencies</p>	
<p>Fire</p>	<p>Not flammable. Flammable gas may be produced on contact with metals. Wear chemical protective suit with self-contained breathing apparatus</p>
<p>Exposure</p>	<p>CALL FOR MEDICAL AID</p> <p>VAPOR Irritating to eyes, nose and throat. If inhaled, will cause coughing or difficult breathing. Move to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen.</p> <p>LIQUID Will burn skin and eyes. Harmful if swallowed. Remove contaminated clothing and shoes. Flush affected areas with plenty of water. IF IN EYES, hold eyelids open and flush with plenty of water. IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk. DO NOT INDUCE VOMITING</p>
<p>Water Pollution</p>	<p>Dangerous to aquatic life in high concentrations. May be dangerous if it enters water intakes. Notify local health and wildlife officials. Notify operators of nearby water intakes.</p>
<p>1. RESPONSE TO DISCHARGE (See Response Methods Handbook) Issue warning-corrosive Restrict access Disperse and flush</p>	<p>2. LABEL 2.1 Category: Corrosive 2.2 Class: 8</p>
<p>3. CHEMICAL DESIGNATIONS 3.1 CG Competibility Class: Non-oxidizing mineral acid</p>	<p>4. OBSERVABLE CHARACTERISTICS 4.1 Physical State (as shipped): Liquid 4.2 Color: Colorless to light yellow</p>

6. FIRE HAZARDS

6.1 Flash Point: Not flammable
6.2 Flammable Limits in Air: Not flammable
6.3 Fire Extinguishing Agents: Not pertinent
6.4 Fire Extinguishing Agents Not to be Used: Not pertinent
6.5 Special Hazards of Combustion
Products: Toxic and irritating vapors are generated when heated
6.6 Behavior in Fire: Not pertinent
6.7 Ignition Temperature: Not flammable
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6.9 Burning Rate: Not flammable
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7.6 Inhibitor of Polymerization:
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7.7 Molar Ratio (Reactant to Product): Data not available
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8. WATER POLLUTION

8.1 Aquatic Toxicity:
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8.3 Biological Oxygen Demand (BOD):
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8.4 Food Chain Concentration Potential:
None

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A-P

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Corrosive material

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Health	
Vapor Irritant	3
Liquid or Solid Irritant	3
Poisons	2
Water Pollution	
Human Toxicity	2
Aquatic Toxicity	2
Aesthetic Effect	2
Reactivity	
Other Chemicals	3
Water	0
Self Reaction	0

11.3 NFPA Hazard Classification:

Category	Classification
Health Hazard (Blue)	3
Flammability (Red)	0
Reactivity (Yellow)	0

12. PHYSICAL AND CHEMICAL PROPERTIES

12.1 Physical State at 15°C and 1 atm:
Liquid
12.2 Molecular Weight: 36.46
12.3 Boiling Point at 1 atm:
123°F = 50.5°C = 323.8°K
12.4 Freezing Point: Not pertinent
12.5 Critical Temperature: Not pertinent
12.6 Critical Pressure: Not pertinent
12.7 Specific Gravity:
1.19 at 20°C (liquid)
12.8 Liquid Surface Tension: Not pertinent
12.9 Liquid Water Interfacial Tension:
Not pertinent
12.10 Vapor (Gas) Specific Gravity:
Not pertinent
12.11 Ratio of Specific Heats of Vapor (Gas):
Not pertinent
12.12 Latent Heat of Vaporization:
178 Btu/lb = 98.6 cal/g =
4.17 X 10⁴ J/kg

Exposure	Remove contaminated clothing and shoes Flush affected areas with plenty of water IF IN EYES, hold eyelids open and flush with plenty of water IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk. DO NOT INDUCE VOMITING
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Water Pollution	Dangerous to aquatic life in high concentrations. May be dangerous if it enters water intakes. Notify local health and wildlife officials. Notify operators of nearby water intakes.
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5.3 Treatment of Exposure: INHALATION: remove person to fresh air; keep him warm and quiet and get medical attention immediately; start artificial respiration if breathing stops. INGESTION: have person drink water or milk; do NOT induce vomiting. EYES: immediately flush with plenty of water for at least 15 min. and get medical attention; continue flushing for another 15 min. if physician does not arrive promptly. SKIN: immediately flush skin while removing contaminated clothing; get medical attention promptly; use soap and wash area for at least 15 min.	
5.4 Threshold Limit Value: 5 ppm	
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Caustics: Flush with water; apply powdered limestone, slaked lime, soda ash, or sodium bicarbonate.
7.5 Polymerization: Not pertinent
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7.7 Molar Ratio (Reactant to Product): Data not available
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9.2 Storage Temperature:	Ambient
9.3 Inert Atmosphere:	No requirement
9.4 Venting:	Open

Density (16°C): 1.0

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HAZARDOUS CHEMICALS DATA BOOK

Second Edition

Edited by

G. Weiss

NOYES DATA CORPORATION

Park Ridge, New Jersey, U.S.A.