

Product Specification



HYDROCHLORIC ACID
Electronic Grade
Meets A.C.S. Specifications

H-4100

Assay (HCl)	36.5 to 38.0%
Specific Gravity at 60°/60°F.	1.185-1.192
Maximum Limits of Impurities	
Appearance	PACST
Color (APHA)	10 Max.
Residue after Ignition	0.0003 %
Bromide (Br)	0.005 %
Sulfate (SO ₄)	0.00005 %
Sulfite (SO ₃)	0.00008 %
Extractable Organic Substances	0.0005 %
Free Chlorine (Cl)	0.00004 %
Ammonium (NH ₄)	0.0003 %
Arsenic (As)	0.0000005%
Heavy Metals (as Pb)	0.00001 %
Iron (Fe)	0.00001 %
Copper (Cu)	0.000005 %
Nickel (Ni)	0.000005 %

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Rev. 1/3/78

III. Stability

Hydrochloric acid will yellow upon exposure to iron, chlorine or organic substances. It has slight evidence of dissociation at temperatures above 1500°C. It is a relatively stable compound and with water it forms a maximum boiling azeotrope that boils at 108.58°C at 1 atm and contains 20.22% HCl.

IV. Fire Hazard

Hydrochloric acid is a non-flammable substance in the air, but if it is allowed to come in contact with various metals, its corrosive nature will cause a reaction and hydrogen will be evolved. This can develop into a dangerously explosive situation in combination with the air.

V. Firefighting Techniques

Fire involved with hydrochloric acid can be dealt with soda ash, flaked lime, carbon dioxide, dry chemical extinguishers or water.

VI. Health Hazards

Hydrogen chloride, both as a gas and in solution as hydrochloric acid, is a corrosive substance and can cause severe and painful burns on contact with any part of the body or if taken internally. The mucous membranes of the eyes and the upper respiratory tract are especially susceptible to the irritating effects of high atmospheric concentrations of hydrogen chloride. The gas or vapor is so penetrating and pungent that when high concentrations do occur, those exposed immediately leave the contaminated area.

1. Ingestion

When concentrated hydrochloric acid is swallowed, it causes severe burns of the mucous membranes of the mouth, esophagus and stomach. The lips and mouth usually turn white, and later brown. There is pain in the throat and stomach, difficulty in swallowing, intense thirst, nausea and vomiting, followed by diarrhea and, in severe cases, by collapse and unconsciousness.

2. Eye Effects

Contact of the eyes with hydrogen chloride, either as a gas or in solution, rapidly causes severe irritation and painful burns of the eyes and eyelids. If the acid is not quickly removed by thorough irrigation with water, there may be prolonged or permanent visual impairment or total loss of sight.

3. Dermal Effects

Concentrated solutions are destructive to clothing and, on contact with skin, causes severe burns unless promptly washed off. Repeated skin contact with dilute solutions may lead to the development of dermatitis. Exposure to the concentrated vapor of anhydrous hydrogen chloride may also result in burns or dermatitis.

4. Inhalation

Inhalation of excessive concentrations of hydrogen chloride vapors immediately produces severe irritation of the upper respiratory tract, resulting in coughing, burning of the throat, and a choking sensation. Reactions encountered in man have usually been limited to inflammation and occasional ulceration of the nose, throat and larynx. If inhaled deeply, edema of the lungs may occur.

5. Threshold Limit Value

The American Conference of Governmental Industrial Hygienists has assigned a threshold limit value of 5 ppm (7 milligrams per cubic meter) by volume in air as the maximum allowable concentration of chlorine vapor for exposures not exceeding a total of eight hours daily.

6. Warning Properties

The characteristic pungent and penetrating odor and the irritating properties of hydrogen chloride fumes is an adequate warning of its presence in the air.

VII. First Aid

In the event of injury resulting from over-exposure, remove the patient from source of contamination and apply the recommended first aid procedures. Respiration is of prime importance. If breathing has ceased, mouth-to-mouth artificial respiration should be performed. Never give anything by mouth to an unconscious person. Medical attention should be obtained as soon as possible after injury, even if the injury appears slight. The physician should be given a detailed account of the incident.

1. Ingestion

Obtain medical attention as soon as possible.

If the patient has swallowed hydrochloric acid and is conscious, give large amounts of lime water or milk of magnesia. Plain water should be given if neither of these are available. Do not give sodium bicarbonate or make any attempt to induce vomiting.

XIII. Disposal of Container

Not applicable--bulk containers used only.

XIV. References

MCA Chemical Safety Data Sheet SD-39 Hydrochloric Acid, Aqueous and Hydrochloric Acid, Anhydrous (1951).

Encyclopedia of Chemical Technology, Second Edition. Volume II. Hydrochloric Acid (1966).