

Product Safety Summary

Hydrochloric Acid

This Product Safety Summary is intended to provide a general overview of the chemical substance. The information on the Summary is basic information and is not intended to provide emergency response information, medical information or treatment information. The summary should not be used to provide in-depth safety and health information. In-depth safety and health information can be found on the Material Safety Data Sheet (MSDS) for the chemical substance.

Chemical Identity

Abbreviation :	HCl
CAS Number :	7647-01-1
Formula:	HCl
Common Names :	Muriatic Acid

Product Overview

- Hydrochloric acid is a highly reactive material
- Hydrochloric acid is a strong inorganic acid that is used in many industrial processes. The application often determines the required product quality and strength. The Applications include regeneration of ion exchangers, pH control and neutralization, pickling of steel, production of inorganic compounds and production of inorganic compounds. Other applications which hydrochloric acid is a fundamental chemical are leather processing, household cleaners and building construction and many smaller applications.
- Like any reactive chemicals, hydrochloric acid products can create hazards if handled carelessly. All persons associated with the transportation, storage or handling of hydrochloric acid must understand the hazards. This includes training in the recommended normal and emergency handling procedures.
- 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.
- The primary hazards with hydrochloric acid are from contact of the skin or inhalation of its vapors. Airborne limits have been established for hydrochloric acid vapor concentrations in the work environment. The American Conference of Governmental Industrial Hygienists (ACGIH) has a threshold limit value (TLV) of 2 ppm for ceiling limit. Occupational Health and Safety Administration (OSHA) has established an exposure limit of 5 ppm as a ceiling limit, also.
- For further safety and health information, the current Material Safety Data Sheet (MSDS) should be used for this substance.

Physical/Chemical Properties

- Hydrochloric acid is a clear, colorless, fuming and corrosive liquid that has a strong pungent odor.
- Hydrochloric acid solubility in water is infinite and is freely soluble in most organic solvents.
- The Boiling point of Hydrochloric acid is 53°C (azeotrope of 20.2%) and the Melting point is -74°C.

- Hydrochloric acid will react with water and a wide variety of chemicals. These reactions can generate heat and the reactions can become progressively more vigorous and can be violent.

Health Information

Acute Hazards

Hydrochloric acid is a potentially hazardous material. A thorough knowledge of potential dangers, with strict adherence to recommended safety practices, is essential before hydrochloric acid products are handled, stored or used. Workers must be properly instructed and supervised in the handling of hydrochloric acid. The primary hazards with hydrochloric acid are the inhalation of its vapors. Limits have been established for allowable vapor concentrations in the work environment. ACGIH has a threshold limit value (TLV) of 2 ppm for a ceiling limit, while OSHA has a 5 ppm ceiling limit established.

Effects on Respiratory System:

Inhalation of vapors can cause coughing, choking, inflammation of the nose, throat, and upper respiratory tract, and in severe cases, pulmonary edema, circulatory failure and death.

Effects on Eyes:

Vapors are irritating and may cause damage to the eyes. Contact may cause severe burns and permanent eye damage.

Effects on Skin:

Can cause redness, pain, and severe skin burns. Concentrated solutions cause deep ulcers and discolor skin.

Effects on Ingestion:

Swallowing hydrochloric acid can cause immediate pain and burns of the mouth, throat, esophagus and gastrointestinal tract. May cause nausea, vomiting, and diarrhea. Swallowing may be fatal.

Chronic Hazards

Long term exposure to concentrated vapors may cause erosion of teeth. Long term exposures seldom occur due to the corrosive properties of the acid.

Environmental Information

Hydrochloric acid is toxic to aquatic life and not expected to biodegrade.

A variety of federal, state and local regulations govern the release of any material to the land, air or surface waters. Any release or discharge of hydrochloric acid must be evaluated in reference to these regulations to determine appropriate response actions and reporting requirements. Acrylic acid is one of the chemicals for which releases to all environmental media must be annually reported.

A regulation called Resource Conservation and Recovery Act (RCRA) must be followed if a volume of hydrochloric acid or material contaminated with acrylic acid is to be disposed of or discarded. Based on RCRA criteria, hydrochloric acid or materials contaminated with hydrochloric acid will likely be considered a "Hazardous Waste" upon disposal and will need to follow certain storage, handling and disposal restrictions as outlined in RCRA. Strict adherence

to these restrictions as well as proper characterization and labeling of the material is the responsibility of the generator and handler of the waste material.

Emphasis should be placed on the prevention of releases through careful design of equipment and sound operating procedures. If hydrochloric acid is lost from containment through a leak or spill, care should be taken to use the proper personal protective equipment, decontamination procedures and other safety considerations. It is important to remember that spills of hydrochloric acid and materials contaminated by hydrochloric acid must be handled as RCRA hazardous wastes.

Any release of acrylic acid greater than the "reportable quantity" designated by the EPA in CERCLA or SARA should be reported immediately on discovery to the National Response Center and State Emergency Response Agency (see current MSDS for reportable quantity and pertinent phone numbers).

In the event of accidental spillage of hydrochloric acid to surface waters or to a municipal water system, contact the local and state pollution control agencies immediately.

Additional Hazard Information

Hydrochloric acid is stable when stored and handled under recommended conditions. However, this shelf life is reduced exponentially with increasing temperature and containers may burst when heated, so exposure to high temperatures must be avoided.

Exposure Potential

Although potential for exposure does exist during hydrochloric acid manufacture, transportation and use, enclosed systems limit the exposure to worker populations and nearby communities. Exposure to the general public may occur in accidental situations. Hydrochloric acid is not intended for the general use by the general public.

Hydrochloric acid vapor has a very strong pungent odor that allows for early detection of any potential release. Hydrochloric acid odor usually will be detected before it reaches the level of the current standard. Hydrochloric acid should only be handled by knowledgeable, well-trained personnel who thoroughly understand the hazards associated with the transportation, storage and use of the chemical.

Workplace exposure should be limited by the use of engineering controls. Hydrochloric acid vapors must be monitored and controlled below applicable regulatory limits. Hydrochloric acid should be processed within a closed system. Worker exposure can potentially happen from leaks in piping system, during repair or replacement of the piping system or during removal of a sample for quality control purposes.

Regulations involving hazardous chemicals are continually evolving and thus exposure guidelines are reviewed regularly and modified whenever new information dictates a change. It is important that all companies handling acrylic acid are aware of the current legislative requirements.

The guidelines established by OSHA, ACGIH, NIOSH and others, represent current thinking and are believed to be conservative and protective of occupational workers. There is not guarantee of absolute safety.

Risk Management

The potential hazards associated with hydrochloric acid can be avoided if workers are adequately instructed in supervised on the proper procedures of handling hydrochloric acid.

Personal protective equipment (PPE) should be selected based on the potential for exposure to particular chemical(s), and the unique properties of that chemical. In general, PPE is not an adequate substitute for appropriate workplace controls (such as ventilation), or other safe work practices. There may be situations when the only practical means of preventing employee exposure is through the effective use of PPE. When PPE is provided to employees, they must be trained in how, where, when, and why the equipment should be used. The facility must also have provisions for decontaminating and replacing such equipment as necessary.

Eye protection in the form of chemical splash goggles should be worn to prevent hydrochloric acid from accidentally splashing in an employee's eye. Goggles should be non-vented, and designed specifically to protect against chemical splash. If an employee wears corrective lenses, chemical goggles should be worn over the lenses. Contact lenses are not recommended for use in areas where there is a potential for exposure to hydrochloric acid. Corrosive vapors can collect behind contact lenses and may cause severe damage to the eye and/or cause the contact lenses to adhere to the eyes.

Skin protection may be found in many forms. Hand protection such as chemical resistant gloves, protective arm sleeves, aprons, full body coveralls, boots, and head coverings are among the types available. Skin protection must be made of a material impervious to hydrochloric acid. Personal protective equipment should be selected on the basis of potential exposure, e.g., gloves may be required for sample collection while full body clothing including gloves, boot covers, head covering may be necessary for spill clean-up. Skin protection for the purpose of preventing chemical exposure may be worn in conjunction with other types of PPE. For example, steel toe safety shoes may be required to prevent a person's foot from being crushed, but an additional boot cover may be required to prevent acrylic acid permeation into the safety shoe. Skin protection PPE is available in a variety of sizes, and should be available in a size that fits the employee wearing it. Improperly sized PPE may compromise its effectiveness and create additional safety hazards. When skin protection PPE is used, there must be a means of cleaning or disposal/replacement of the PPE.

Respiratory protection is available in two basic varieties, air purifying, and air supplied. In general, air purifying respirators provide less protection than air supplied respirators. Both types, however, have their particular advantages and limitations. The appropriate type of respirator must be selected to provide the appropriate level of protection for the anticipated degree of exposure to airborne hydrochloric acid (vapor or mist). Detailed guidance for the selection of respiratory protection can be found in The American National Standards Institute Document Z88.2. Respiratory protective equipment should be approved by NIOSH. It must be carefully maintained, inspected, and cleaned. All employees required to wear respiratory protection must be medically cleared to do so (this ensures their physical capability to wear a respirator) and trained to use and care for the equipment. OSHA requirements for respiratory protection can be found in 29 CFR 1910.134.

Properly designed emergency showers and eyewash fountains should be placed in convenient locations wherever hydrochloric acid is used. All employees should know the location and operation of this equipment. All equipment must be frequently inspected to make sure they are in proper working condition.

Federal/Science Findings

U.S. Environmental Protection Agency – Integrated Risk Information System (IRIS)
<http://www.epa.gov/ncea/iris/subst/0396.htm>

U.S. Environmental Protection Agency
<http://www.epa.gov/ttn/atw/hlthef/hydrochl.html>

U.S Department of Labor – Occupational Safety and Health Administration (OSHA)
http://www.osha.gov/dts/chemicalsampling/data/CH_246300.html

American Conference of Governmental Industrial Hygienists (ACGIH)
<http://www.acgih.org>

Contact Information

<http://www.basf.com>

MSDS

http://worldaccount.basf.com/wa/PublicMSDS~en_US/Search

References

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