

Hydrochloric Acid

Description

Hydrochloric acid (CAS# 7647-01-0), or hydrogen chloride, is either a colorless liquid with a pungent odor, or a colorless to slightly yellow gas which can be shipped as a liquefied compressed gas. It is used in the manufacture of phosphoric acid, chlorine dioxide, ammonium chloride, fertilizers, dyes, and artificial silk and pigments for paints. It is used as a refining ore in the production of tin and tantalum, as a lab reagent, and as a metal treating agent. It is used to remove scale and dust from boilers and heat exchange equipment, to clean membranes in desalination plants, to increase oil well output, to prepare synthetic rubber products by treating isoprene, and to clean and prepare other metals for coatings. It is used in the neutralization of waste streams, the recovery of zinc from galvanized iron scrap, the production of chloride chemicals, the production of vinyl chloride from acetylene and alkyl chlorides from olefins, the manufacture of sodium glutamate and gelatin, the conversion of cornstarch to syrup, sugar refining, electroplating, soap refining, leather tanning, and the photographic, textile, brewing, and rubber industries. It is used as an antiseptic in toilet bowls against animal pathogenic bacteria, and in food processing as a starch modifier.

Chemical Properties

Hydrochloric acid is one of the most corrosive of the nonoxidizing acids in contact with copper alloys, and is handled in dilute solutions. It is soluble in benzene, alcohol, and ether; it is insoluble in hydrocarbons, and incompatible or reactive with metals, hydroxides, amines, and alkalis. Hydrochloric acid's fumes have an acid, penetrating odor. Aqueous solutions of hydrochloric acid attack and corrode nearly all metals, except mercury, silver, gold, platinum, tantalum, and certain alloys. It may be colored yellow by traces of iron, chlorine, and organic matter. Synonyms for hydrochloric acid are hydrogen chloride, anhydrous hydrogen chloride, aqueous hydrogen chloride, chlorohydric acid, spirit of salts, and muriatic acid.

Identification

Chemical Name: Hydrochloric acid

Regulatory Name: Hydrochloric acid

Formula: HCl

DOT Label: Corrosive

CAS: 7647-01-0

CHRIS: HCl

UN Number: 1789

Health effects

Exposure to hydrochloric acid can cause circulatory collapse which may lead to death; it can also cause asphyxial death due to glottic edema. It can also cause conjunctivitis and corneal burns, inflammation and ulceration of the respiratory tract, dermatitis, skin burns, rhinitis, laryngitis, tracheitis, bronchitis, pulmonary edema, dental erosion, hoarseness, a feeling of suffocation, nausea, vomiting, abdominal pain, diarrhea, dehydration, convulsions, oliguria, hypotension, chills, shock, lethargy, stupor, permanent visual damage, cough, and choking. Ingestion or skin contact with hydrochloric acid can cause corrosion of mucous membranes of the mouth, throat, and esophagus, with immediate pain and dysphagia; it can also cause gastric hemorrhage and intense thirst.

Exposure Values

IDLH: 50 ppm (NIOSH, 1997)

TLV TWA: 5 ppm For Hydrogen Chloride Ceiling Limit. (ACGIH, 1999)

ERPG-1: 3 ppm (AIHA, 1999)

ERPG-2: 20 ppm (AIHA, 1999)

ERPG-3: 150 ppm (AIHA, 1999)

NIOSH REL: C 5 ppm (7 mg/m³)

OSHA PEL: C 5 ppm (7 mg/m³)