

Product Stewardship Summary

Hydrochloric acid

General Statement

Hydrochloric acid is a strong acid commonly used for pH modification in industrial and laboratory settings. Concentrated hydrochloric acid is corrosive, and capable of causing severe burns on contact. Dilute hydrochloric acid is only hazardous if sufficient acidity remains to cause burns or irritation.

Chemical Identity

Name: Hydrochloric acid

Brand Names: Ashland uses hydrochloric acid as a pH modifier in a large number of product lines.

Chemical name (IUPAC): Hydrogen Chloride

CAS number(s): 7647-01-0

ES number: 231-595-7

Molecular formula: HCl

Uses and Applications

Ashland primarily uses hydrochloric acid to adjust pH values in a variety of products.

Physical/Chemical Properties

Phys/Chem Safety Assessment

Property	Value
Form	Liquid solution in water: 37.8%
Physical state	Liquid
Color	Clear
Odor	Irritating and pungent. Odor threshold about 7mg/m ³
Density	1.189 g/cm ³ @ 20°C
Melting / boiling point	-26°C / 48°C
Flammability	Not flammable
Explosive properties	Not explosive
Self-ignition temperature	Not applicable
Vapor pressure	28.3 kPa
Mol weight	36.46 g/mol
Water solubility	>6-%
Flash point	Not applicable
Octanol-water partition coefficient (Log _{K_{ow}})	Not applicable



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Exposure, Hazard and Safety Assessment

The following section describes possible exposures scenarios and hazards associated with hydrochloric acid. The exposure assessment describes both the amount of and the frequency with which a chemical substance reaches a person, a population of people, or the environment. Hazard refers to the inherent properties of a substance that make it capable of causing harm to human health or the environment. The safety assessment reports the possibility of a harmful event arising from exposure to a chemical or physical agent under specific conditions. Just because a substance may possess potentially harmful properties does not mean that it automatically poses a risk. It is not possible to make that determination without understanding the exposure.

Human Health Effects

Human Exposure Assessment

Consumer: As certain dilutions of hydrochloric acid are commercially available in home improvement stores, consumer exposure is possible. While some inhalation exposure may be expected, skin exposure is likely to be the predominant hazard.

Worker: Workers in laboratory or manufacturing settings may be exposed to concentrated hydrochloric acid or hydrogen chloride gas.

Human Hazard Assessment

Effect Assessment	Result
Acute Toxicity Oral / inhalation / dermal	H331: Toxic if inhaled.
Irritation / corrosion Skin / eye / respiratory test	H314: Causes severe skin burns and eye damage. H315: May cause respiratory irritation.
Sensitization	Not classified.
Toxicity after repeated exposure Oral / inhalation / dermal	Prolonged or repeated exposure does not cause any harmful effects
Genotoxicity / Mutagenicity	Does not affect genetic system
Carcinogenicity	Not considered as a carcinogen
Reproductive / Developmental Toxicity	Not toxic to reproduction or to unborn children
Aspiration hazard	Not applicable

Human Health Safety Assessment

Consumer: Consumer usage of hydrochloric acid is unlikely to involve quantities large enough to cause substantial inhalation toxicity. Skin exposure may result in burns.

Worker: Hydrochloric acid can evolve a toxic gas. Due to the high vapor pressure, hydrogen chloride gas will be produced even at room temperatures. Higher concentrations of acid and higher temperatures will increase the rate of gas emission. Inhalation of hydrogen chloride can cause lung damage. Skin or eye contact can cause severe burns.

Environmental Effects

Environmental Exposures

Hazardous exposure to the environment is unlikely, except in the case of transportation or storage incidents. While hydrochloric acid is available for consumer purchase, the quantities involved are insufficient to cause more than very localized environmental harm. Normal usage of hydrochloric acid will not release amounts or concentrations of hydrochloric acid sufficient to cause effects to animals or the environment.

Environmental Hazard Assessment:

Effect Assessment	Result
Aquatic toxicity	Not toxic to aquatic organisms

Fate and behavior	Result
Biodegradation	Not applicable
Bioaccumulation potential	Not applicable.
PBT / vPvB conclusion	This substance is not considered to be persistent, bioaccumulating and toxic (PBT) or very persistent and very bioaccumulating (vPvB)

Environmental Safety Assessment

With the exception of large spills, no environmental toxicity is anticipated from hydrochloric acid.

Risk Management Recommendations

Workers handling concentrated hydrochloric acid must wear protective clothing and eye protection. Proper ventilation or respiratory protection must be used if there is a potential for buildup of hydrogen chloride gas. Store hydrochloric acid only in approved corrosion-resistant containers.

Regulatory Agency Review

Exposure to hydrochloric acid in the workplace is covered by established exposure limits. A partial list of references follows:

US OSHA PEL: 5 ppm (ceiling)

ACGIH TLV: 2 ppm (ceiling)

EU and member states: <http://osha.europa.eu/en/topics/ds/oel/index.stm/members.stm>

China: 7.5 mg/m³ (ceiling)

Hydrochloric acid is listed on:

- REACH Registered Substances ((EC) 1907/2006)
- US TSCA inventory
- Australia Inventory of Chemical Substances
- Canada Domestic Substances List
- China Inventory of Existing Chemical Substances
- Japan Inventory of Existing & New Chemical Substances
- Japan Industrial Safety & Health Law Inventory
- Korea Existing Chemicals Inventory
- New Zealand Inventory of Chemicals
- Philippines Inventory of Chemicals and Chemical substances

Regulatory Information / Classification and Labeling

Under the Globally Harmonized System for classification and labeling (GHS), substances are classified according to their physical, health, and environmental hazards. The hazards are communicated via specific labels and the (Extended) SDS. GHS attempts to standardize hazard communication so that the intended audience (workers, consumers, transport workers, and emergency responders) can better understand the hazards of the chemicals in use.

GHS Classification:

Corrosive to metals: Category 1

Skin corrosion/irritation: Category 1B

Serious eye damage/eye irritation: Category 1

Specific target organ toxicity (single exposure): Category 3 (respiratory system)

Hazard Statements:

H314: Causes severe skin burns and eye damage

H335: May cause respiratory irritation

H290: May be corrosive to metals

Signal Word:

Danger

Precautionary Statements:

P234: Keep only in original container

P260: Do not breathe dust/fume/gas/mist/vapors/spray

P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P303+P361+P353: IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

P304+P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P309+P311: IF exposed or if you feel unwell: Call a POISON CENTER or doctor/physician.

P501: Dispose of contents/container to permitted recycling or waste destruction company.

Hazard Pictograms:



Conclusion

Hydrochloric acid is a useful substance in industrial and laboratory settings. If proper precautions are taken

against its corrosive and irritating properties, it is a very low-risk material. Dilute hydrochloric acid is unlikely to retain enough acidity to cause harm.

Contact Information with Company

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Additional Information

For more information on GHS, visit <http://www.osha.gov/dsg/hazcom/ghsguideoct05.pdf> or http://live.unece.org/trans/danger/publi/ghs/ghs_welcome_e.html.

Ashland product stewardship summaries are located at <http://www.ashland.com/sustainability/product/product-stewardship>

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REACH registration is specific to Importers/Manufacturers that place the chemical on the EU market, and is specific to registered uses. Inclusion on the list of REACH Registered Substances does not automatically imply registration by Ashland.

Inclusion on the New Zealand Inventory of Chemicals applies only to the pure substance listed. The importer of record must determine whether or not their substances are in compliance.