HYDROCHLORIC ACID

A. GENERAL INFORMATION

TRADE NAME (COMMON NAME)
HYDROCHLORIC ACID (various grades)

CHEMICAL NAME AND/OR SYNONYM
Hydrochloric Acid  Synonym: Muriatic Acid

FORMULA
HCl (37-38 wt.% in water)

MOLECULAR WEIGHT
36.46
(for the anhydrous)

GENERAL CHEMICAL CORPORATION
CN 1829
Morristown, N.J. 07960-1829

CONTACT
Director of Environmental Matters

PHONE NUMBER
(201) 455-5630

LAST ISSUE DATE
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CURRENT ISSUE DATE

B. FIRST AID MEASURES

Eyes: Immediately flush with water, lifting eyelids occasionally to facilitate irrigation; continue flushing for 20 to 30 minutes. Do not use chemical antidotes. Get medical help. Speed is essential.

Skin: Immediately flush with water and remove contaminated clothing if exposure to liquid acid has occurred. Do not use chemical antidotes. Continue deluge showering for at least 15 minutes. Get medical evaluation. Speed is essential.

Inhalation: Promptly remove to fresh air (rescuers may in some situations need to wear personal protective equipment — see Section E). If breathing has stopped, apply artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen, provided a qualified operator is available. Get prompt medical attention.

Ingestion: If conscious and free of convulsions, give large amounts of water immediately. Do not induce vomiting. Give a non-gassing neutralizer such as milk, milk of magnesia or calcium hydroxide, etc. Do not give carbonates, bicarbonates, chalk. Get prompt medical attention.

Information on hazards, precautions, first aid, etc., is abbreviated. More detailed information is contained in references cited in Section J.

C. HAZARDS INFORMATION

HEALTH

INHALATION
Inhalation of vapor or mist can cause irritation or corrosive burns to the upper respiratory tract. Intense lacrimation, coughing, throat irritation, sneezing and labored breathing may occur. Following high exposures, lung irritation and pulmonary edema can also occur, sometimes delayed. LC50 (ihl-rat): 3124 ppm / 1 hour. LCLo (ihl-human): 1000 ppm / 30 minutes.

INGESTION
Although unlikely to occur, ingestion of hydrochloric acid can cause irritation and burns to the gastrointestinal tract; may perforate stomach or esophagus in extreme cases. Asphyxia may occur from edema of the larynx. Dehydration is a primary hazard with concentrated material. For more dilute solutions, the animal LD50 (rabbit) of 900 mg/kg may be pertinent (moderately toxic) - Ref. (a).

SKIN
Severity of injury will depend on quantity, concentration and duration of contact. Liquid contact: may cause severe burns, pain and brownish or yellow stains. Solution contact: irritation, dermatitis or burns. Vapor contact: irritation or burns. Mist contact: irritation.

EYES
Severity of injury will depend on quantity, concentration and duration of contact. Both liquid and vapor contact can cause irritation, corneal burns, and conjunctivitis. Permanent damage with loss of sight can occur - Reference (b).

PERMISSIBLE CONCENTRATION: AIR
(SEE SECTION J)
The OSHA/TWA and ACGIH/TLV are the same:
5ppm Ceiling (as Hydrogen Chloride)

BIOLICAL
None established.

UNUSUAL CHRONIC TOXICITY
Excessive exposure, repeated or prolonged, may cause erosion of the teeth. Gastritis and chronic bronchitis among workers exposed to hydrochloric acid have been reported. Reference (c).
C. HAZARDS (Cont.)

FIRE AND EXPLOSION

FLASH POINT N.A. °C
No flash point.

OPEN CUP CLOSED CUP

AUTO IGNITION TEMPERATURE Not applicable.

OC FLAMMABLE LIMITS IN AIR (% BY VOL.)
LOWER - Not applicable UPER - Not applicable

UNUSUAL FIRE AND EXPLOSION HAZARDS
Acid reacts with steel and most other metals to generate hydrogen gas, which is a serious fire and explosive hazard. See, also, Hazardous Decomposition Products, Section G.

D. PRECAUTIONS/PROCEDURES

FIRE EXTINGUISHING AGENTS RECOMMENDED
If involved in a fire, use water; neutralize any spilled material with chemically basic substances such as soda ash, lime or limestone (see neutralization technique under “Spill or Leak” below).

FIRE EXTINGUISHING AGENTS TO AVOID
None known.

SPECIAL FIRE FIGHTING PRECAUTIONS
Firefighters should wear self-contained, NIOSH-approved, breathing apparatus with full facepiece and full protective clothing. Use water spray to cool fire-exposed containers. Take precautions so as not to splash this material onto other personnel.

VENTILATION
Provide corrosion-resistant ventilation sufficient to reduce acid mist and vapor concentrations to or below current TLV levels. Packaging and unloading areas and open processing equipment may require mechanical exhaust systems or local exhaust. Specialized handling (e.g., bottles) may require closed ventilated system (e.g., exhausted hood). For details on applications, see Reference (b).

NORMAL HANDLING
Do not get in eyes, on skin or clothing. Avoid breathing mist or vapor. Use only with adequate ventilation. Keep away from metals and incompatible chemicals. Wash thoroughly after handling.

STORAGE
Store in a dry, well-ventilated area away from heat, out of the sun and away from oxidizing substances (nitric acid, etc.) or other incompatible materials (see Section G). Elevated temperatures will increase the vapor pressure of this product. Use necessary caution when opening the container.

SPILL OR LEAK (ALWAYS WEAR PERSONAL PROTECTIVE EQUIPMENT — SECTION E)
Fully protected personnel (see Section E) should dilute small spills or leaks cautiously with plenty of water. Neutralize residue with alkali such as soda ash, lime or limestone. Provide ample ventilation when neutralizing to eliminate the carbon dioxide that is formed. For major spills, keep unprotected personnel away. Contain the acid by diking the spill with soil or clay. Recover the acid, if possible. Attempt to keep out of sewer. Any release to the environment of this material may be subject to federal and/or state reporting requirements. Check with appropriate agencies.

SPECIAL PRECAUTIONS/PROCEDURES/LABEL INSTRUCTIONS
SIGNAL WORD — DANGER!
To prevent ignition of hydrogen gas generated by accidental contact of metals with the acid, smoking, open flames and sparks must not be permitted in storage or handling areas. Medical surveillance and employee education are recommended for workers with this acid [see Reference (b)].

E. PERSONAL PROTECTIVE EQUIPMENT

RESPIRATORY PROTECTION
Generally not required in a closed ventilation system. For spill or emergency where required, use a respirator approved by NIOSH for hydrogen chloride gas and/or mist, as applicable. Some exposures may require self-contained breathing apparatus, generally with full facepiece, or supplied-air respirator, generally with a full facepiece, helmet, or hood. For details and other choices, see Reference (b).

EYES AND FACE
As a minimum, wear hard hat, chemical safety goggles, and full facepiece (if not obstructed by the respirator in use, if any). Do not wear contact lenses. In exposure to mists, chemical safety goggles are necessary; add a face shield if pouring liquid.

HANDS, ARMS, AND BODY
Prevent any contact of liquid with body. As a minimum, wear acid-resistant apron, protective clothing, boots, and gauntlet gloves for routine product-handling use. For increased protection, include acid-resistant trousers and jacket. Diluted solutions also require such protection [see Ref. (b)]. Wash clothing upon contamination before reuse.

OTHER CLOTHING AND EQUIPMENT
Provide eyewash stations and quick-drench shower facilities convenient to areas of handling, use or storage. Keep neutralization supplies and equipment at hand.
**F. PHYSICAL DATA**

<table>
<thead>
<tr>
<th>MATERIAL IS (AT NORMAL CONDITIONS):</th>
<th>☒ LIQUID</th>
<th>☐ SOLID</th>
<th>☐ GAS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BOILING POINT</strong></td>
<td>51 °C</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MELTING POINT</strong></td>
<td>-74 °C</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SPECIFIC GRAVITY</strong></td>
<td>(liquid)</td>
<td>1.19 @25 °C</td>
<td></td>
</tr>
<tr>
<td><strong>VAPOR DENSITY</strong></td>
<td>(estimated)</td>
<td>1.3</td>
<td></td>
</tr>
<tr>
<td><strong>SOLUBILITY IN WATER</strong> ( % by Weight)</td>
<td>complete</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>EVAPORATION RATE</strong></td>
<td>(Butyl Acetate = 1)</td>
<td>(Ether = 1)</td>
<td>&gt;1</td>
</tr>
<tr>
<td><strong>% VOLATILES BY VOLUME</strong> (AT 20°C)</td>
<td></td>
<td></td>
<td>100</td>
</tr>
<tr>
<td><strong>pH</strong></td>
<td>1% solution, pH: 0.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>VAPOR PRESSURE</strong></td>
<td>mm Hg @25 °C:</td>
<td></td>
<td>~186/180</td>
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</table>

**G. REACTIVITY DATA**

<table>
<thead>
<tr>
<th>STABILITY</th>
<th>☒ STABLE</th>
<th>☐ UNSTABLE</th>
<th>CONDITIONS TO AVOID</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>High temperatures (may cause containers to burst).</td>
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</tbody>
</table>

**INCOMPATIBILITY (MATERIALS TO AVOID)**

Most metals (see Section C). Alkalis, metallic oxides, amines, esters, and certain other organics: beta-propiolactone, propylene oxide [Reference (e)] — cause exothermic reactions, possibly violent. Carbonates, cyanides, sulfides — yield toxic gases. Water-reactive materials, such as sulfuric acid, oleum and acetic anhydride — cause exothermic reaction.

**HAZARDOUS DECOMPOSITION PRODUCTS**

Hydrogen chloride vapors (released normally at ambient conditions) are released in increasing amounts at higher temperatures.

**HAZARDOUS POLYMERIZATION**

<table>
<thead>
<tr>
<th>☐ MAY OCCUR</th>
<th>☒ WILL NOT OCCUR</th>
<th>CONDITIONS TO AVOID</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>None known.</td>
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</table>

**H. HAZARDOUS INGREDIENTS (Mixtures Only)**

<table>
<thead>
<tr>
<th>MATERIAL OR COMPONENT/C.A.S. #</th>
<th>WT. %</th>
<th>HAZARD DATA (SEE SECT. J)</th>
</tr>
</thead>
</table>

Not applicable.
I. ENVIRONMENTAL

DEGRADABILITY/AQUATIC TOXICITY

Degradability: Not applicable — inorganic.
Aquatic Toxicity: 282 ppm/96hr./mosquito fish/TL<sub>50</sub>/fresh water.
100-330 ppm/48 hr./shrimp/LC<sub>50</sub>/salt water.

OCTANOL/WATER PARTITION COEFFICIENT

Unknown.

[Reference (f)].

EPA HAZARDOUS SUBSTANCE?
(CLEAN WATER ACT SECT. 311) ☒ YES ☐ NO

IF SO, REPORTABLE QUANTITY:

13,500 # (37 wt. % acid) 13,150 (38 wt. % acid)

40 CFR 116-117

WASTE DISPOSAL METHODS MUST COMPLY WITH FEDERAL, STATE AND LOCAL DISPOSAL OR DISCHARGE LAWS

Waste hydrochloric acid (37-38%) should be cautiously diluted with water and neutralized with an alkali. Neutralized waste must be disposed of in accordance with applicable disposal regulations. Users should review their operations in terms of applicable federal, state and local laws and regulations, then consult with appropriate regulatory agencies before discharging or disposing of waste material. Waste may have to be disposed of by an approved contractor.

RCRA STATUS OF UNUSED MATERIAL IF DISCARDED:

EPA "hazardous waste" (corrosive), if discarded

HAZARDOUS WASTE NUMBER: (IF APPLICABLE)

DO02

40 CFR 261

J. REFERENCES

PERMISSIBLE CONCENTRATION REFERENCES

TLV: ACGIH 1985-86 List, "Threshold Limit Values and Biological Exposure Indices".

REGULATORY STANDARDS

D.O.T. CLASSIFICATION: Corrosive material

49 CFR 173

FDA regulations apply to the use of food grade product (21 CFR).

GENERAL

(a) NIOSH Registry (RTECS), 1981-82, Accession No. MW4025000 (Hydrochloric Acid).
(c) ACGIH: "Documentation of Threshold Limit Values", 4th edition.
(f) U.S. Coast Guard CHRS Manual; entry: Hydrochloric Acid.

K. ADDITIONAL INFORMATION

This product in various grades is not for drug use; nor is it for food use unless the product is labeled “food grade”.

PSDS FILE NO. GC-4010

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