1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Hydrochloric acid
Product Number : H1758
Brand : Sigma
Index-No. : 017-002-01-X
CAS-No. : 7647-01-0

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA
Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Corrosive to metals (Category 1), H290
Skin corrosion (Category 1B), H314
Specific target organ toxicity - single exposure (Category 3), Respiratory system, H335

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Signal word : Danger

Hazard statement(s)
H290 May be corrosive to metals.
H314 Causes severe skin burns and eye damage.
H335 May cause respiratory irritation.

Precautionary statement(s)
P234 Keep only in original container.
P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P264 Wash skin thoroughly after handling.
P271 Use only outdoors or in a well-ventilated area.
P280 Wear protective gloves/ protective clothing/ eye protection/ face
protection.

P301 + P330 + P331  IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353  IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304 + P340 + P310  IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor.
P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor.
P363  Wash contaminated clothing before reuse.
P390  Absorb spillage to prevent material damage.
P403 + P233  Store in a well-ventilated place. Keep container tightly closed.
P405  Store locked up.
P406  Store in corrosive resistant stainless steel container with a resistant inner liner.
P501  Dispose of contents/ container to an approved waste disposal plant.

2.3  Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.2  Mixtures

Formula :  HCl
Molecular weight :  36.46 g/mol

Hazardous components

<table>
<thead>
<tr>
<th>Component</th>
<th>Classification</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrochloric acid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAS-No.</td>
<td>7647-01-0</td>
<td>Met. Corr. 1; Skin Corr. 1B;</td>
</tr>
<tr>
<td>EC-No.</td>
<td>231-595-7</td>
<td>Eye Dam. 1; STOT SE 3;</td>
</tr>
<tr>
<td>Index-No.</td>
<td>017-002-01-X</td>
<td>H290, H314, H335</td>
</tr>
<tr>
<td>Registration number</td>
<td>01-2119484862-27-XXXX</td>
<td>&gt;= 30 - &lt; 50 %</td>
</tr>
</tbody>
</table>

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1  Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician. Continue rinsing eyes during transport to hospital.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2  Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3  Indication of any immediate medical attention and special treatment needed
No data available
5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture

No data available

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information

No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Wear respiratory protection. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.
For personal protection see section 8.

6.2 Environmental precautions

Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up

Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Value</th>
<th>Control parameters</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrochloric acid</td>
<td>7647-01-0</td>
<td>C</td>
<td>2.000000 ppm</td>
<td>USA. ACGIH Threshold Limit Values (TLV)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Remarks</td>
<td>Upper Respiratory Tract irritation</td>
<td>Not classifiable as a human carcinogen</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C</td>
<td>5.000000 ppm 7.000000 mg/m3</td>
<td>USA. NIOSH Recommended Exposure Limits</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Often used in an aqueous solution.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>C</td>
<td>5.000000 ppm 7.000000 mg/m3</td>
<td>USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants</td>
</tr>
</tbody>
</table>

The value in mg/m3 is approximate. Ceiling limit is to be determined from breathing-zone air samples.
<table>
<thead>
<tr>
<th></th>
<th>C</th>
<th>2 ppm</th>
<th>USA. ACGIH Threshold Limit Values (TLV)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>C</td>
<td>5 ppm</td>
<td>USA. NIOSH Recommended Exposure Limits</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7 mg/m³</td>
<td></td>
</tr>
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<td></td>
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</tr>
<tr>
<td></td>
<td>C</td>
<td>5 ppm</td>
<td>USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7 mg/m³</td>
<td></td>
</tr>
</tbody>
</table>

### 8.2 Exposure controls

#### Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

#### Personal protective equipment

**Eye/face protection**
- Tightly fitting safety goggles. Faceshield (8-inch minimum). Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

**Skin protection**
- Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

**Full contact**
- Material: Nitrile rubber
- Minimum layer thickness: 0.11 mm
- Break through time: 480 min
- Material tested: Dermatril® (KCL 740 / Aldrich Z677272, Size M)

**Splash contact**
- Material: Nitrile rubber
- Minimum layer thickness: 0.11 mm
- Break through time: 480 min
- Material tested: Dermatril® (KCL 740 / Aldrich Z677272, Size M)

*data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374*

If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

#### Body Protection

Complete suit protecting against chemicals. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

#### Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

#### Control of environmental exposure

Do not let product enter drains.
9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a) Appearance Form: liquid
   Colour: light yellow

b) Odour pungent

c) Odour Threshold No data available

d) pH No data available

e) Melting point/freezing point -30 °C (-22 °F)

f) Initial boiling point and boiling range > 100 °C (> 212 °F) - lit.

g) Flash point Not applicable

h) Evaporation rate No data available

i) Flammability (solid, gas) No data available

j) Upper/lower flammability or explosive limits No data available

k) Vapour pressure 227 hPa (170 mmHg) at 21.1 °C (70.0 °F)
   547 hPa (410 mmHg) at 37.7 °C (99.9 °F)

l) Vapour density No data available

m) Relative density 1.2 g/cm³ at 25 °C (77 °F)

n) Water solubility soluble

o) Partition coefficient: n-octanol/water No data available

p) Auto-ignition temperature No data available

q) Decomposition temperature No data available

r) Viscosity No data available

s) Explosive properties No data available

t) Oxidizing properties No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Bases, Amines, Alkali metals, Metals, permanganates, e.g. potassium permanganate, Fluorine, metal acetylides, hexalithium disilicide
10.6 **Hazardous decomposition products**
Hazardous decomposition products formed under fire conditions. - Hydrogen chloride gas
Other decomposition products - No data available
Hazardous decomposition products formed under fire conditions. - Hydrogen chloride gas
In the event of fire: see section 5

11. **TOXICOLOGICAL INFORMATION**

11.1 **Information on toxicological effects**

- **Acute toxicity**
  No data available (Hydrochloric acid)
  Inhalation: Inhalation may provoke the following symptoms: Respiratory irritation Cough Difficulty in breathing Pneumonia (Hydrochloric acid)
  Dermal: No data available (Hydrochloric acid)
  No data available (Hydrochloric acid)

- **Skin corrosion/irritation**
  Skin - Rabbit (Hydrochloric acid)
  Result: Causes burns.

- **Serious eye damage/eye irritation**
  Eyes - Rabbit (Hydrochloric acid)
  Result: Corrosive to eyes

- **Respiratory or skin sensitisation**
  Did not cause sensitisation on laboratory animals. (Hydrochloric acid)

- **Germ cell mutagenicity**
  No data available (Hydrochloric acid)

- **Carcinogenicity**
  This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification. (Hydrochloric acid)

  (Hydrochloric acid)

  (Hydrochloric acid)

  IARC: 3 - Group 3: Not classifiable as to its carcinogenicity to humans (Hydrochloric acid)

  NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

  OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

- **Reproductive toxicity**
  No data available (Hydrochloric acid)

  No data available (Hydrochloric acid)

  **Specific target organ toxicity - single exposure**
  The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with respiratory tract irritation. (Hydrochloric acid)

  **Specific target organ toxicity - repeated exposure**
  The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

- **Aspiration hazard**
  No aspiration toxicity classification (Hydrochloric acid)

- **Additional Information**
  RTECS: MW4025000

  Inhalation of vapors may cause: burning sensation, Cough, wheezing, Shortness of breath, spasm, inflammation and edema of the larynx, spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary edema (Hydrochloric acid)
12. ECOLOGICAL INFORMATION

12.1 Toxicity
Toxicity to fish  LC50 - Lepomis macrochirus (Bluegill) - 24.6 mg/l - 96 h (Hydrochloric acid)
Toxicity to daphnia and other aquatic invertebrates  EC50 - Daphnia magna (Water flea) - 4.91 mg/l - 48 h (Hydrochloric acid)

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available (Hydrochloric acid)

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
May be harmful to aquatic organisms due to the shift of the pH. Do not empty into drains.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1789  Class: 8  Packing group: II
Proper shipping name: Hydrochloric acid
Reportable Quantity (RQ):
Poison Inhalation Hazard: No

IMDG
UN number: 1789  Class: 8  Packing group: II
Proper shipping name: HYDROCHLORIC ACID
EMS-No: F-A, S-B

IATA
UN number: 1789  Class: 8  Packing group: II
Proper shipping name: Hydrochloric acid

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Revision Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrochloric acid</td>
<td>7647-01-0</td>
<td>1993-04-24</td>
</tr>
</tbody>
</table>

SARA 311/312 Hazards
Acute Health Hazard
Massachusetts Right To Know Components

Hydrochloric acid
CAS-No. 7647-01-0
Revision Date 1993-04-24

Pennsylvania Right To Know Components

Water
CAS-No. 7732-18-5
Revision Date 1993-04-24

New Jersey Right To Know Components

Water
CAS-No. 7732-18-5
Revision Date 1993-04-24

California Prop. 65 Components

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Eye Dam. Serious eye damage
H290 May be corrosive to metals.
H314 Causes severe skin burns and eye damage.
H318 Causes serious eye damage.
H335 May cause respiratory irritation.
Met. Corr. Corrosive to metals
Skin Corr. Skin corrosion
STOT SE Specific target organ toxicity - single exposure

HMIS Rating
Health hazard: 3
Chronic Health Hazard:
Flammability: 0
Physical Hazard 0

NFPA Rating
Health hazard: 3
Fire Hazard: 0
Reactivity Hazard: 0

Further information
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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information
Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.6 Revision Date: 03/08/2016 Print Date: 11/10/2018