1. Product and company identification

Product identifier

Trade name: Cleaning Solution B

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

General use: Cleaning agent, Laboratory chemicals for pH electrodes. Only for specialists for purposes of research and analysis.

Details of the supplier of the safety data sheet

Company name: Hamilton Bonaduz AG
Street/POB-No.: Via Crusch 8
Postal Code, city: 7402 Bonaduz Switzerland
WWW: www.hamiltoncompany.com
Telephone: +41 58 610 12 76
Telefax: +41 58 610 00 10
Dept. responsible for information: Susanne Nääf-Rüdiger, Telephone: +41 58 610 12 76, E-mail SNaef@hamilton.ch

Emergency phone number

GIZ-Nord, Germany, Telephone: +49 (0)551-19240

2. Hazards identification

Emergency overview

Appearance: Form: liquid
Color: colorless
Odor: odorless
Classification: Corrosive to Metals - Category 1;

Hazard symbols:

Signal word: Warning
Hazard statements: May be corrosive to metals.
Precautionary statements: Keep only in original container. Absorb spillage to prevent material damage.

Regulatory status

This material is considered hazardous by the U.S. OSHA Hazard Communication Standard (29 CFR 1910.1200) and SIMDUT in Canada.

Hazards not otherwise classified

A corrosive effect cannot be ruled out because of the pH value. Liquid splashes can lead to irritations of the eyes.
see section 11: Toxicological information
3. Composition / Information on ingredients

Chemical characterization: Aqueous solution

Hazardous ingredients:

<table>
<thead>
<tr>
<th>CAS No.</th>
<th>Designation</th>
<th>Content</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrochloric acid</td>
<td>4 %</td>
<td>Corrosive to Metals - Category 1. Skin Corrosion - Category 1B. Specific Target Organ Toxicity (Single Exposure) - Category 3.</td>
<td></td>
</tr>
</tbody>
</table>

4. First aid measures

In case of inhalation: Move victim to fresh air. In case of respiratory difficulties seek medical attention.

Following skin contact: After contact with skin, wash immediately with plenty of water. Remove contaminated clothing. In case of skin reactions, consult a physician.

After eye contact: Immediately flush eyes with plenty of flowing water for 10 to 15 minutes holding eyelids apart. Seek the attention of an ophthalmologist immediately.

After swallowing: Rinse mouth and drink large quantities of water. If you feel unwell, seek medical advice.

Most important symptoms/effects, acute and delayed

In case of ingestion: burns (pain). Risk of perforation
After eye contact: Liquid splashes can lead to irritations of the eyes.

Information to physician

Treat symptomatically.

5. Fire fighting measures

Flash point/flash point range: no data available
Auto-ignition temperature: no data available
Suitable extinguishing media: Co-ordinate fire-fighting measures to the fire surroundings.

Specific hazards arising from the chemical

Not combustible. Hydrogen may form upon contact with metals (danger of explosion!). In case of fire may be liberated: Hydrogen chloride, chlorine, Hydrogen.

Protective equipment and precautions for firefighters:

In case of surrounding fires: Wear self-contained breathing apparatus.

6. Accidental release measures

Personal precautions: Do not breathe vapor or spray. Avoid contact with skin and eyes. Wear protective equipment.

Environmental precautions: Do not allow to penetrate into soil, waterbodies or drains.

Methods for clean-up: Absorb with liquid-binding material (e.g. sand, diatomaceous earth, acid- or universal binding agents) and place in closed containers for disposal. Wash spill area with plenty of water.
7. Handling and storage

Handling
Advices on safe handling: Provide adequate ventilation. Avoid contact with skin and eyes. Wear protective equipment.

Storage
Requirements for storerooms and containers:
Keep container tightly closed. Store at room temperature.

8. Exposure controls / personal protection

Exposure guidelines
Occupational exposure limit values:

<table>
<thead>
<tr>
<th>CAS No.</th>
<th>Designation</th>
<th>Type</th>
<th>Limit value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hydrochloric acid</td>
<td>ACGIH: Ceiling</td>
<td>2.98 mg/m³; 2 ppm (A4)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NIOSH: Ceiling</td>
<td>7 mg/m³; 5 ppm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OSHA: Ceiling</td>
<td>7 mg/m³; 5 ppm</td>
</tr>
</tbody>
</table>

Engineering controls
Provide good ventilation and/or an exhaust system in the work area.
See also information in chapter 7, section storage.

Personal protection equipment (PPE)
Eye/face protection
Tightly sealed goggles according to OSHA Standard - 29 CFR: 1910.133 or ANSI Z87.1-2010.

Skin protection
Wear suitable protective clothing.
Glove material: Nitrile rubber or butyl caoutchouc (butyl rubber).
Breakthrough time: >480 min.
Observe glove manufacturer's instructions concerning penetrability and breakthrough time.

Respiratory protection:
Respiratory protection must be worn whenever the TLV (WEL) levels have been exceeded.
Use combination filter type E-P2/P3 according to OSHA Standard - 29 CFR: 1910.134 or ANSI Z88.2.

General hygiene considerations:
Change contaminated clothing.
Avoid contact with skin and eyes.
Wash hands before breaks and after work.

9. Physical and chemical properties

Information on basic physical and chemical properties

Appearance:
Form: liquid
Color: colorless

Odor:
odorless

Odor threshold:
no data available

pH value:
at 20 °C: approx. 1
Melting point/freezing point: no data available
Initial boiling point and boiling range: approx. 100 °C
Flash point/flash point range: no data available
Evaporation rate: no data available
Flammability: no data available
Explosion limits: no data available
Vapor pressure: no data available
Vapor density: no data available
Density: at 20 °C: approx. 1.0 g/mL
Water solubility: at 20 °C: soluble
Partition coefficient: n-octanol/water: no data available
Auto-ignition temperature: no data available
Thermal decomposition: no data available
Additional information: no data available

10. Stability and reactivity

Reactivity: May be corrosive to metals.
Chemical stability: Product is stable under normal storage conditions.
Possibility of hazardous reactions
Hydrogen may form upon contact with metals (danger of explosion!).
Conditions to avoid: Protect from excessive heat.
Incompatible materials: Metals
Hazardous decomposition products:
Hydrogen chloride, chlorine, Hydrogen
Thermal decomposition: no data available
11. Toxicological information

**Toxicological tests**

Toxicological effects:
- Acute toxicity (oral): Lack of data.
- Acute toxicity (dermal): Lack of data.
- Acute toxicity (inhalative): Lack of data.
- Skin corrosion/irritation: Lack of data.
- Eye damage/irritation: Lack of data.
- Sensitisation to the respiratory tract: Lack of data.
- Skin sensitisation: Lack of data.
- Germ cell mutagenicity/Genotoxicity: Lack of data.
- Carcinogenicity: Lack of data.
- Reproductive toxicity: Lack of data.
- Effects on or via lactation: Lack of data.
- Specific target organ toxicity (single exposure): Lack of data.
- Specific target organ toxicity (repeated exposure): Lack of data.
- Aspiration hazard: Lack of data.

**Symptoms**

In case of ingestion: burns (pain). Risk of perforation

After eye contact: Liquid splashes can lead to irritations of the eyes.

**General remarks**

A corrosive effect cannot be ruled out because of the pH value.

Further hazardous properties cannot be excluded. Handle in accordance with good industrial hygiene and safety practice.

12. Ecological information

**Ecotoxicity**

Aquatic toxicity: Harmful effects on water organisms by modification of pH-value.

**Mobility in soil**

no data available

**Persistence and degradability**

Further details: no data available

**Additional ecological information**

General information: Do not allow to enter undiluted resp. in large quantities into surface water or into drains.

13. Disposal considerations

**Product**

Recommendation: Dispose of waste according to applicable legislation.
Contaminated packaging
Recommendation: Dispose of waste according to applicable legislation. Non-contaminated packages may be recycled.

14. Transport information

USA: Department of Transportation (DOT)
- Identification numbers: UN1789
- Proper shipping name: UN 1789, Hydrochloric acid
- DOT hazard class or division: 8
- PG: III
- Label codes: 8
- Special provisions: A3, IB3, T4, TP1
- Packaging - Exceptions: 154
- Packaging - Non-bulk: 203
- Packaging - Bulk: 241
- Quantity limitations - Passenger aircraft / rail:
  - 5 L
- Quantity limitations - Cargo only:
  - 60 L
- Vessel stowage - Location:
  - C
- Vessel stowage - Other:
  - 8

Sea transport (IMDG)
- UN number: UN 1789
- Proper shipping name: UN 1789, HYDROCHLORIC ACID
- IMDG: Class 8, Subrisk -
- Packing Group: III
- EmS: F-A, S-B
- Special provisions: 223
- Limited quantities:
  - 5 L
- EQ: E1
- Contaminated packaging - Instructions: P001, LP01
- Contaminated packaging - Provisions: -
- IBC - Instructions: IBC03
- IBC - Provisions: -
- Tank instructions - IMD: -
- Tank instructions - UN: T4
- Tank instructions - Provisions: TP1
- Stowage and handling: Category C.
- Properties and observations:
  - Colourless liquid. An aqueous solution of the gas hydrogen chloride. Highly corrosive to most metals. Causes burns to skin eyes and mucous membranes.
- Marine pollutant:
  - No
- Segregation group:
  - 1
Air transport (IATA)

UN/ID number: UN 1789
Proper shipping name: UN 1789, HYDROCHLORIC ACID
ICAO/IATA: Class 8
PG: III
Hazard: Corrosive
EQ: E1
Passenger Ltd Qty.: Pack.Instr. Y841 - Max. Net Qty/Pkg. 1 L
Passenger: Pack.Instr. 852 - Max. Net Qty/Pkg. 5 L
Cargo: Pack.Instr. 856 - Max. Net Qty/Pkg. 60 L
Special Provisioning: A3 A803
ERG: 8L

15. Regulatory information

U.S. Federal Regulations

Hydrochloric acid: TSCA Inventory: listed; EPA flags T
TSCA HPVC: not listed
Carcinogen Status:
IARC Rating: Group 3
OSHA Carcinogen: not listed
NTP Rating: not listed
Clean Air Act:
Accidental Release Prevention: Threshold 5000 lbs. / Basis for listing = a Hazardous Air Pollutants: Code X
Clean Water Act:
Hazardous Substances: RQ 5000 lbs.
Other Environmental Laws:
CERCLA: RQ 5000 lbs.
SARA Title III Section 302, EHS: TPQ 500 lbs. / RQ 5000 lbs.
SARA Title III Section 313, Toxic Release: Conc. 1.0% / Threshold Standard
NIOSH Recommendations:
Occupational Health Guideline: 0332
OSHA Process Safety Management: Threshold 5000 lbs.

National regulations - Great Britain

Hazchem-Code: 2R

16. Other information

Text for labeling: Contains 4 % Hydrochloric acid. Safety data sheet available on request.

Hazard rating systems:

NFPA Hazard Rating:
Health: 1 (Slight)
Fire: 0 (Minimal)
Reactivity: 0 (Minimal)

HMIS Version III Rating:
Health: 1 (Slight)
Flammability: 0 (Minimal)
Physical Hazard: 0 (Minimal)
Personal Protection: B
Reason of change: Changes in section 2: labeling (P-phrases)

Date of first version: 9/24/2012

Department issuing data sheet
Contact person: see section 1: Dept. responsible for information

The information in this data sheet has been established to our best knowledge and was up-to-date at time of revision. It does not represent a guarantee for the properties of the product described in terms of the legal warranty regulations.