

GHS Classification

ID567

Hydrochloric acid

CAS 7647-01-0

Date Classified: Apr. 20, 2006 (Environmental Hazards: Mar. 31, 2006)

Physical Hazards

Reference Manual: GHS Classification Manual (Feb. 10, 2006)

Hazard class	Classification	symbol	signal word	hazard statement	Rational for the classification
1 Explosives	Not applicable	-	-	-	Gas (GHS definition)
2 Flammable gases	Not classified	-	-	-	Non-combustible gas (Hommel, 1991)
3 Flammable aerosols	Not applicable	-	-	-	Not aerosol products
4 Oxidizing gases	Not classified	-	-	-	UNRTDG No.1050, Class: 2.3, Subsidiary risks Class: 8
5 Gases under pressure	Liquefied gas	Gas cylinder	Warning	Contains gas under pressure; may explode if heated	UNRTDG No. 1050, Class: 2.3. "Critical temp: 51 degC" (Hommel, 1991)
6 Flammable liquids	Not applicable	-	-	-	Gas (GHS definition)
7 Flammable solids	Not applicable	-	-	-	Gas (GHS definition)
8 Self-reactive substances and mixtures	Not applicable	-	-	-	Gas (GHS definition)
9 Pyrophoric liquids	Not applicable	-	-	-	Gas (GHS definition)
10 Pyrophoric solids	Not applicable	-	-	-	Gas (GHS definition)
11 Self-heating substances and mixtures	Not applicable	-	-	-	Gas (GHS definition)
12 Substances and mixtures, which in contact with water, emit flammable gases	Not applicable	-	-	-	Gas (GHS definition)
13 Oxidizing liquids	Not applicable	-	-	-	Gas (GHS definition)
14 Oxidizing solids	Not applicable	-	-	-	Gas (GHS definition)
15 Organic peroxides	Not applicable	-	-	-	Gas (GHS definition)
16 Corrosive to metals	Classification not possible	-	-	-	Test methods applicable to gas substances are not available

Health Hazards

Hazard class	Classification	symbol	signal word	hazard statement	Rational for the classification
1 Acute toxicity (oral)	Category 3	Skull and crossbones	Danger	Toxic if swallowed	It was set as Category 3 based on the toxic value of the higher one.(Rat LD50=238 to 277 mg/kg and 700 mg/kg (SIDS (2002)), and higher one is former.)
1 Acute toxicity (dermal)	Not classified	-	-	-	Based on rabbit LD50 >5010mg/kg (SIDS (2002)), it was set as the outside of Category.
1 Acute toxicity (inhalation: gas)	Category 3	Skull and crossbones	Danger	Toxic if inhaled	It was considered as Category 3, based on 1411ppm obtained from the statistical calculations after conversion from rat LC50 = 4.2, 4.7 and 283mg/L/60min (SIDS (2002)). In addition, since it became lower than the lowest value of calculated data, lowest value 4.2mg/L (4-hour product portfolio managements equivalents 1411ppm) of data is adopted.
1 Acute toxicity (inhalation: vapour)	Classification not possible	-	-	-	No data available
1 Acute toxicity (inhalation: dust, mist)	Category 2	Skull and crossbones	Danger	Fatal if inhaled	Rat LC50 = 1.68mg/L / 1h is the aerosol data (SIDS (2002)). It was set as category 2 based on 4-hour value 0.42mg/L of this value.
2 Skin corrosion / irritation	Category 1A-1C	Corrosion	Danger	Causes severe skin burns and eye damage	There are reports of cases that corrosivity was observed in rabbit skin irritation test with 1 - 4 hour exposure depending on concentration (SIDS (2002)), that stimulation and ulcer accompanied by skin discoloration having occurred on mice and rats with 5-30 minute exposure (SIDS (2002)), and that it also caused mild to serious stimulativeness, sore and burn (SIDS (2002)). Because of what mentioned above, this product was considered to have corrosivity, and it was classified as Category 1A-1C.
3 Serious eye damage / eye irritation	Category 1	Corrosion	Danger	Causes serious eye damage	About damage and the stimulativeness of an eye, it is based on exposure to hydrochloric acid as waters of this product altogether. A serious stimulus, damage, and corrosiveness is indicated for eye in a result of two or more animal (including a rabbit) examinations (SIDS (2002)), and fear of permanent damage or loss of eyesight is indicated to be also in humans (SIDS (2002)).
4 Respiratory/skin sensitization	Respiratory sensitization: Category 1; Skin sensitization: Not classified	(Respiratory sensitization)Health hazard; (Skin sensitization)-	(Respiratory sensitization)Da nger; (Skin sensitization)-	(Respiratory sensitization)May cause allergy or asthma symptoms or breathing difficulties if inhaled; (Skin sensitization)-	[Respiratory sensitization] Since it was listed as one of the chemical substances causing the sensitivity of occupational allergy, created by the specially set-up committee of the Japanese occupational and environmental allergology meeting, it was referred to as Category 1. Still, there is a report that the postexposure bronchial spasms was caused by humans to the cleaning agents which included hydrogen chlorides and that asthmatic symptoms were still caused by slight stimulus one year later (ACGIH (2003)). [Skin sensitization] Adding to the negative result (SIDS (2002)) in Maximization Test of a guinea pigs, and Ear Swelling Test of a mouse, there is a report (SIDS (2002)) that nobody indicated positive reactions in the test applied to 15 humans on 10-14th days after [induction of sensitization], and it put outside of the Category.

5	Germ cell mutagenicity	Classification not possible	-	-	-	No data from in vivo tests are found, except for positive results in sex-linked recessive lethal tests using drosophila. Although there are positive results from some in vitro mutagenicity tests, these results are considered as insufficient to be the basis for mutagenesis in human germ cells. So it was decided that the substance "could not be classified".
6	Carcinogenicity	Not classified	-	-	-	Based on the classification of Group 3 (1992) by IARC, and A4 (2003) by ACGIH, it was set as the outside of Category. In addition, in carcinogenicity tests of rats or mice, there is no evidence which suggests carcinogenicity (SIDS (2002)), and many human epidemiological studies are also negative in the relation between cancer occurrence and hydrogen chloride exposure (IARC 54 (1992), PATTY (5th, 2001)).
7	Toxic to reproduction	Classification not possible	-	-	-	All data are the results of the test in the administration to pregnancy rat or mouse, and there is no bad effect to the development of neonatal animals. However, it was unknown about the effect to reproductive function and reproductive potential in the administration before pregnancy (prematuring) to parent animals, "it cannot be classified" since data is insufficient.
8	Specific target organs/systemic toxicity following single exposure	Category 1 (respiratory)	Health hazard	Danger	Cause damage to organs (respiratory)	The symptoms, such as dyspnea, laryngitis, bronchitis, bronchus contraction, and pneumonia, is presented by inhalation exposure in humans, and the upper airway edema, respiratory tract inflammations, necrosis, and a lung blister are reported. (DFGOTvol.6 (1994), PATTY (5th, 2001), IARC 54 (1992), ACGIH (2003)). Moreover, in the animal studies, the toxic effects with morphological injury to lungs and bronchial tubes, such as bronchitis with mucosal necrosis, pulmonary edema, bleeding, thrombus, etc. in the guidance value in Category 1 (ACGIH (2003), SIDS (2002)). It was classified into Category 1 (respiratory systems) based on the above the results in human and animal.
9	Specific target organs/systemic toxicity following repeated exposure	Category 1 (tooth, respiratory organs)	Health hazard	Danger	Causes damage to organs (tooth, respiratory organs) through prolonged or repeated exposure	There are two or more reports that humans who receive repeated exposure complain injury to teeth by erosions (SIDS and (2002), EHC 21 (1982), DFGOTvol.6 (1994), and PATTY (5th, 2001)), and increased frequency of a chronic bronchitis is also reported. (DFGOTvol.6 (1994)). It was classified as Category 1 (a tooth, respiratory systems) based on these information.
10	Aspiration hazard	Not applicable	-	-	-	Gas (GHS definition)

Environmental Hazards

Hazard class	Classification	symbol	signal word	hazard statement	Rational for the classification
11 Hazardous to the aquatic environment (acute)	Category 1	Environment	Warning	Very toxic to aquatic life	It was classified into Category 1 from 48-hour EC50=0.492mg/L of Crustacea (Daphnia magna), and others (SIDS, 2005).
11 Hazardous to the aquatic environment (chronic)	Not classified	-	-	-	Toxicity factor is considered to be strong acid as aqueous solution, but toxic effect is eased by the buffer action in the environmental water.