

GHS Classification

ID570

Chlorine

CAS 7782-50-5

Date Classified: Jul. 24, 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 (ICSC(J), 2000; etc.)
3 Flammable aerosols	Not applicable	-	-	-	Not aerosol products
4 Oxidizing gases	Category 1	Flame over circle	Danger	May cause or intensify fire; oxidizer	Category 1 and oxidizing gas (ISO 10156-2)
5 Gases under pressure	Low pressure liquefied gas	Gas cylinder	Warning	Contains gas under pressure; may explode if heated	Low pressure liquefied gas because of the critical temp: 143.8 to 144degC.
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)	Classification not possible	-	-	-	No data available
1 Acute toxicity (dermal)	Classification not possible	-	-	-	No data available
1 Acute toxicity (inhalation: gas)	Category 2	Skin and crossbones	Danger	Fatal if inhaled	It was considered as Category 2 based on each 4-hour equivalent of two data of a rat being LC50 = 146ppm (EHC 21 (1982), ACGIH (2005)).
1 Acute toxicity (inhalation: dust, mist)	Not applicable	-	-	-	Gas (GHS definition)
2 Skin corrosion / irritation	Category 1A-1C	Corrosion	Danger	Causes severe skin burns and eye damage	It was classified as Category 1A-1C based on the descriptions that there is a case where it produced slight burn to the human face with exposure to chlorine gas (EHC 21 (1982)) and that corrosivity may be seen on skin (HSDB (2005)). In addition, there are descriptions that "frostbite and corrosivity. Skin burns and pain." as primary disaster/acute manifestation when liquid chlorine touches the skin (ICSC (J), (2000)) and that liquid chlorine causes chilblain and a burn (HSDB (2005)), contacting liquefied chlorine needs special care. This product is classified as Xi; R36/R37/R38 in EU (EU ACGIH (2005)).
3 Serious eye damage / eye irritation	Category 1	Corrosion	Danger	Causes serious eye damage	Although mild by level at a There is statement that irritation was acknowledged in the ophthalmic by the monkey (PATTY (5th, 2001)), and that from mild to severe irritation on human depend on concentration, but that all are recovered for a short times (EHC 21 (1982)), and there is a statement that irritation may acknowledge in the ophthalmic of human, and a critical or permanent obstacle may be done (HSDB (2005)). The case of being the highest-risk was taken among these information, and it was set as Category 1. In addition, this product is classified into Xi; R36/R37/R38 by EU.
4 Respiratory/skin sensitization	Respiratory sensitization: Classification not possible; Skin sensitization: Classification not possible	(Respiratory sensitization)-; (Skin sensitization)-	(Respiratory sensitization)-; (Skin sensitization)-	(Respiratory sensitization)-; (Skin sensitization)-	Respiratory sensitization: Since data is insufficient, it cannot be classified. Skin sensitization: No data

5	Germ cell mutagenicity	Not classified	-	-	-	There are no data from multi-generation epidemiological and mutagenicity tests in humans, and there is a report of a negative result in an in vivo micronucleus test in mammals (mice). So the substance was regarded as outside the categories.
6	Carcinogenicity	Not classified	-	-	-	It was set as the outside of Category based on being classified into the group 3 according to IARC (ACGIH-TLV (2005)), and classified into A4 according to ACGIH (ACGIH (2005)).
7	Toxic to reproduction	Not classified	-	-	-	Based on the description of no effect to the reproductive potential of parents and the development and growth of neonatal in the test of rat and mouse (EHC 21 (1982), IRIS (2002), IUCLID (2000)), and no effect to every stage from pregnancy to lactation in chlorine plant employees (EHC 21 (1982)), it was considered as on the outside of Category.
8	Specific target organs/systemic toxicity following single exposure	Category 1 (respiratory, nervous system)	Health hazard	Danger	Cause damage to organs (respiratory, nervous system)	In mouse, rabbit, and dog, in the equivalent dose to the amount of exposure of guidance value of Category 1, respiratory disorders, such as pulmonary edema, haemorrhage lung, decrease of lung function, bronchitis, and tract epithelium necrosis, are observed. The similar disorders are observed also in rat with no description of dosage (EHC 21 (1982)). Moreover, in mouse, cat, rabbit and guinea pig, there are also the descriptions of the inflammation of respiratory tract membrane, choking, breathing-rate reduction, and upper respiratory tract irritation (EHC 21 (1982), ACGIH (2005), PATTY (5th, 2001)). Also in humans, disorder or irritation to respiratory system, such as pneumonia, pulmonary edema, bronchitis, tracheal ulcer, decrease of lung function, asthma and asthmatic symptoms (RADS), irritation to throat or nose, cough, and breathing difficulties are described (EHC 21 (1982), ACGIH (2005), PATTY (5th, 2001)). It was classified into Category 1 (respiratory systems) based on these information. It was classified into Category 1 (nervous systems) based on the description that it causes vomiting, headache, sense of uneasiness, syncope, fatigue, etc. and also causes photosensitivity enhancement and direct effect to the cerebral cortex in humans (EHC 21 (1982), PATTY (5th, 2001)).
9	Specific target organs/systemic toxicity following repeated exposure	Category 1 (respiratory organs, kidneys, Olfactory organ); Category 2 (tooth)	Health hazard	Danger; Warning	Causes damage to organs (respiratory organs, kidneys, Olfactory organ) through prolonged or repeated exposure; May cause damage to organs (tooth) through prolonged or repeated exposure	There are a publication that a disorder is done to lungs with the dosage of guidance value range of the Category 1 in an inhalation experiment of a rat and a mouse, and a publication (EHC 21 (1982), PATTY (5th, 2001), IUCLID (2000)) that the airway epithelium inflammation and histologic changes were seen. A potential of causing a bronchus disease and pulmonary hemorrhage in humans is pointed out (EHC 21 (1982)), and the views on a cough, the pain of a throat, coughing up of blood, chest pains, etc. are indicated (ACGIH (2005)). Moreover, there is also statements that there are fears of lung permanent failure and a chronic bronchitis (HSDFS (1998), SITTIG (4th, 2002)). It was classified in Category 1 (respiratory systems) based on these information. It was classified in Category 1 (kidney) based on the statement (PATTY (5th, 2001)) that biochemical changes which indicates the effects on kidney function was seen with the dosage of guidance value range of Category 1 in the rat inhalation experiments. It was classified in Category 1 (olfaction organ) and Category 2 (tooth), based on descriptions in EHC 21 (1982) and PATTY (5th, 2001) that dysosmia was caused in humans, and descriptions in HSDFS (1998) and SITTIG (4th, 2002) that a disorder is done to a tooth. In addition, although there was a publication (IRIS (2002)) that the dosage of guidance value range of Category 2 indicated 10%-20% of underweight in oral administration to mice and rats as compared with the control, it was considered the secondary effects under influence on a respiratory-organs system or the kidney.
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 96-hour LC50=14microg/L of fishes (Rainbow trout) (IUCLID, 2000).
11 Hazardous to the aquatic environment (chronic)	Category 1	Environment	Warning	Very toxic to aquatic life with long lasting effects	Classified into Category 1, since acute toxicity was Category 1, and behavior in water and bioaccumulative potential are unknown.