

GHS Classification

ID626

Sulfuric acid

CAS 7664-93-9

Date Classified: Jun. 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	-	-	-	There are no chemical groups associated with explosive properties present in the molecules.
2 Flammable gases	Not applicable	-	-	-	Liquid (GHS definition)
3 Flammable aerosols	Not applicable	-	-	-	Not aerosol products
4 Oxidizing gases	Not applicable	-	-	-	Liquid (GHS definition)
5 Gases under pressure	Not applicable	-	-	-	Liquid (GHS definition)
6 Flammable liquids	Not classified	-	-	-	Non-combustible (ICSC(J), 2000; etc.).
7 Flammable solids	Not applicable	-	-	-	Liquid (GHS definition)
8 Self-reactive substances and mixtures	Not applicable	-	-	-	There are no chemical groups associated with explosive or self-reactive properties present in the molecule.
9 Pyrophoric liquids	Not classified	-	-	-	Non-combustible (ICSC (J), 2000; etc.)
10 Pyrophoric solids	Not applicable	-	-	-	Liquid (GHS definition)
11 Self-heating substances and mixtures	Not classified	-	-	-	Non-combustible (ICSC (J), 2000; etc.)
12 Substances and mixtures, which in contact with water, emit flammable gases	Not applicable	-	-	-	The chemical structure of the substance does not contain metals or metalloids(B, Si, P, Ge, As, Se, Sn, Sb, Te, Bi, Po, At).
13 Oxidizing liquids	Not classified	-	-	-	UNRTDG Class: 8
14 Oxidizing solids	Not applicable	-	-	-	Liquid (GHS definition)
15 Organic peroxides	Not applicable	-	-	-	Containing no -O-O- structure
16 Corrosive to metals	Classification not possible	-	-	-	Although it is classified into the class 8 in UNRTDG, identification with skin corrosivity cannot be performed. Moreover, although there is also information that it corrodes almost all metals (ICSC (J) (2000)), there is no data based on set test methods.

Health Hazards

Hazard class	Classification	symbol	signal word	hazard statement	Rational for the classification
1 Acute toxicity (oral)	Category 5	-	Warning	May be harmful if swallowed	It was set as Category 5 based on rat LD50 value: 2140mg/kg (SIDS, 2001) and description that there is a report of deaths by the ingested doses (amount of ingested doses is unknown) in humans.
1 Acute toxicity (dermal)	Classification not possible	-	-	-	No data available
1 Acute toxicity (inhalation: gas)	Not applicable	-	-	-	Liquid (GHS definition)
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	Based on rat LC50 value (4 hour exposure): 0.375mg/L (1-hour exposure) and : 347ppm (4 hour equivalent: 0.347mg/L) (all are (SIDS and 2001)), it was set as Category 2
2 Skin corrosion / irritation	Category 1A-1C	Corrosion	Danger	Causes severe skin burns and eye damage	Since pH of concentrated sulfuric acid was 1 or less, it was judged to be a corrosive substances with the GHS classification standards, and classified as Category 1A-1C.
3 Serious eye damage / eye irritation	Category 1	Corrosion	Danger	Causes serious eye damage	From description that the critical damage to the eye accompanied by solutions of anterior chamber of eye was acknowledged in example of accident in human (ATSDR, 1998), and from description that moderate irritation with 5% liquid and severe irritation with 10% liquid were acknowledged to the eye of a rabbit (SIDS, 2001), and since pH of this product was two or less. So it was set as Category 1.
4 Respiratory/skin sensitization	Respiratory sensitization: Classification not possible; Skin sensitization: Not classified	-	-	-	Respirator: No data Skin: There is no test data on skin sensitizing of sulfuric acids. Although sulfuric acid has been industrially used for several decades, there is no case report of skin sensitization, while skin injuries by skin irritation is well known. Although an extensive amount of sulfate ion exists internally (the sulfate ion in serum being 33 mmol/L and 50 times that in cells), allergic reactions do not occur. In metal study of allergic aspermatogenic sulfate, even if allergy positive with metal may occur, sulfuric ion is presumed to result in allergic negative as is suggested by the negative results in sulfate of zinc. Based on the description that a conclusion is drawn from the results mentioned above that sulfate does not cause allergy to humans(SIDS, 1998).Therefore it was put outside of the Category.
5 Germ cell mutagenicity	Classification not possible	-	-	-	For in vivo, any test data could not be found for which the productive cells and the somatic cells were used, and for in vitro mutagenicity tests, we found the positive result only in the test system with the single indicator (chromosomal aberration test) (ATSDR, 1998).And we found the negative results in other indices. Therefore we presupposed that we could not classify it.

6	Carcinogenicity	Classification not possible	-	-	-	Professional exposure of the mist of the inorganic strong acid including sulfuric acids is classified into group 1 according to IARC (1992), into A2 according to ACGIH (2004), and into K according to NTP (2005). And respecting evaluation of IARC and evaluation of the latest NTP, it is classified into category 1. However, sulfuric acids itself was classified into the category 4 according to DFGOT (vol.15, 2001). Also, none of those institutions has not carried out the carcinogenic classification, it was presupposed that it cannot be classified.
7	Toxic to reproduction	Not classified	-	-	-	Since it is not observed of fetotoxicity and teratogenicity at the dose causing no maternal toxicity in inhalation test fetal period organogenesis rabbit and mouse (SIDS, 2001) and it was judged of no concern of reproductive toxicity because in chronic toxicity study and carcinogenicity tests, the effects on the reproductive organ of both sexes is not observed and the effect by irritation/caustic is main toxicity directly (SIDS, 2001), it was considered as on the outside of Category.
8	Specific target organs/systemic toxicity following single exposure	Category 1 (respiratory)	Health hazard	Danger	Cause damage to organs (respiratory)	Based on the descriptions that in the inhalation exposure of low concentration by humans, airway irritation such as cough and breath shortness is identified (DFGOT, 2001), and at high exposure levels, acute effects such as cough, breath shortness and hemoptysis shedding etc., and permanent effects such as functional depression of lungs, fibrosis and emphysema were identified (ATSDR, 1998), and that hemorrhage in lungs and dysfunction were identified by 8-hour inhalation exposure in guinea pigs (ATSDR, 1998). So it was referred to as Category 1 (respiratory systems).
9	Specific target organs/systemic toxicity following repeated exposure	Category 1 (respiratory organs)	Health hazard	Danger	Causes damage to organs (respiratory organs) through prolonged or repeated exposure	In the 28-day inhalation exposure test using rat, cell proliferation in laryngeal mucosa is acknowledged in guidance value of Category 1(SIDS (2001)), and in the 14 to 139-day repetition inhalation exposure test using the guinea pigs of the concentration of guidance value within the limits of Category 1, respiratory and lung disorder, such as nasal-septum dropsy, pulmonary emphysema, atelectasis, hyperemia, dropsy, bleeding and thrombosis of bronchioles are recognized (ATSDR(1998)), and further in the 78-week inhalation exposure test using a cynomolgus, histological change as hyperplasia of a cell, the wall thickening, etc. in bronchioles of lungs was acknowledged in the dosage (0.048 mg/L, 23.5 Hr/Day) of the range of the guidance value of Category 1, so it was classified to as Category 1 (respiratory systems).
10	Aspiration hazard	Classification not possible	-	-	-	No data available

Environmental Hazards

Hazard class	Classification	symbol	signal word	hazard statement	Rational for the classification
11 Hazardous to the aquatic environment (acute)	Category 3	-	-	Harmful to aquatic life	It was classified into Category 3 from 96-hour LC50=16-28mg/L of fishes (Bluegill) (SIDS, 2003).
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.