GHS Classification

ID1189 Borate(1−), tetrafluoro−, hydrogen

CAS 16872-11-0 Date Classified: Jun. 23, 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), 1995).
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	−	−	−	Not combustible (ICSC (J), 1995)
10	Pyrophoric solids	Not applicable	−	−	−	Liquid (GHS definition)
11	Self-heating substances and mixtures	Not classified	−	−	−	Not combustible (ICSC(J) (1995))
12	Substances and mixtures, which in contact with water, emit flammable gases	Not classified	−	−	−	Stable to water. (literature has the publication "it dissolves into water well". Moreover, this product is marketed as aqueous solutions.)
13	Oxidizing liquids	Not classified	−	−	−	Not classified because of UNRTDG No. 1775, Class: 8, PG II (not Class: 5.1)
14	Oxidizing solids	Not applicable	−	−	−	Liquid (GHS definition)
15	Organic peroxides	Not applicable	−	−	−	Inorganic compound
16	Corrosive to metals	Category 1	Corrosion	Warning	May be corrosive to metals	Although there is no test data, UNRTDG is classified into 8 and II according to the UNRTDG No. (1775). Since there is a description as a use that "to clean metal surfaces before welding; to brighten aluminum; as a solute in electrolytes for plating metals such as chromium, iron, nickel, copper, silver, zinc, cadmium, indium, tin, and lead (has a high throwing power)" (Merck, 13th, 2001), it was set as Category 1.

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	Based on the LD50 values in rats of 100mg/kg (RTECS, 2004) and 239mg/kg (in the purity of 100%)) [464mg/kg (51.5%)] (IUCLID, 2000), we adopted the lower value to classify the substance as Category 3.
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)	Classification not possible	−	−	−	No data available
2	Skin corrosion / irritation	Category 1A-1C	Corrosion	Danger	Causes severe skin burns and eye damage	It was set as category 1A-1C since there is the description that there is caustic to human skin and severe burns is caused (HSDB, 2003; ICSC (J), 1995; SITTIG, 4th, 2002; HSFS, 1999), and it was set as "C;R34" by EU-Annex I (Access on Jul.2005). [view] It is more desirable to be set as 1A from a viewpoint of safety, when further categorizing needs to be performed.
3	Serious eye damage / eye irritation	Category 1	Corrosion	Danger	Causes serious eye damage	Due to the description that it has causticity to human eye (ICSC(J)1995; SITTIG, 4th, 2002;HSFS, 1999), it was classified into Category 1.
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)−	No data available
5	Germ cell mutagenicity	Classification not possible	−	−	−	Although there is the reports that it is negative in vitro mutagenicity test (Ames test) (IUCLID, 2000), there is no data of an in vivo mutagenicity test. And because of insufficient data, it cannot be classified.
6	Carcinogenicity	Classification not possible	−	−	−	Although fluoride was classified into A4 (corresponding to outer Category) in ACGIH-TLV (2005), due to insufficient data, it cannot be classified.
7	Toxic to reproduction	Classification not possible	−	−	−	Although fluoride is classified into C (there is no developmental toxicologies) according to MAK/BAT (2005), since data is insufficient, it cannot be classified.

8	Specific target organs/systemic toxicity following single exposure	Category 2 (respiratory)	Health hazard	Warning	May cause damage to organs (respiratory)	It was considered as Category 2 (respiratory systems) based on the description that it has respiratory tracts and pulmonary edemas may be caused (ICSC (J) (1995), SITTIG (4th, 2002), and HSFS (1999) of Priority 2 document).
9	Specific target organs/systemic toxicity following repeated exposure	Category 1 (bone)	Health hazard	Danger	Causes damage to organs (bone) through prolonged or repeated exposure	Since there is a description of the influence (fluorosis) on a bone as fluoride (ACGIH-TLV (2005) of Priority 1 document) and there are similar descriptions also (ICSC(J)(1995), SITTIG(4th, 2002), and HSFS(1999) of Priority 2 document), it is classified into Category 1 (bone). In addition, although there is a description of effect also on the kidney, blood, and the respiratory system (SITTIG(4th, 2002) and HSFS(1999)), the data which is supported was not found.
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)	Not classified	-	-	-	It carried out the outside of Category from 96-hour LC50=2.6g/L of fishes (Zebrafish) (IUCLID, 2000).
11	Hazardous to the aquatic environment (chronic)	Not classified	-	-	-	Since not water-insoluble (aqueous solubility = 8700mg/L(IUCLID, 2000)) and acute toxicity is low.