GHS Classification

ID2 Acrylic acid

CAS 79-10-7 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	-	-	-	Containing no chemical groups with explosive properties
2	Flammable gases	Not applicable	-	-	-	Classified as "liquid" according to GHS definition
3	Flammable aerosols	Not applicable	-	-	-	Not aerosol products
4	Oxidizing gases	Not applicable	-	-	-	Classified as "liquid" according to GHS definition
5	Gases under pressure	Not applicable	-	-	-	Classified as "liquid" according to GHS definition
6	Flammable liquids	Category 3	Flame	Warning	Flammable liquid and vapour	The flash point is 54degC (c.c.) (ICSC, 1999), which is classified into Category 3, those containing stabilizers are classified into Class 3 and Class 8 (UN#2218) (UN Recommendations on the Transport of Dangerous Goods)
7	Flammable solids	Not applicable	-	-	-	Classified as "liquid" according to GHS definition
8	Self-reactive substances and mixtures	Classification not possible	-	-	-	Classification not possible due to lack of data, though containing unsaturated bonds. Those containing stabilizers are classified into Class 3 and Class 8 (UN#2218) (UN Recommendations on the Transport of Dangerous Goods)
9	Pyrophoric liquids	Not classified	-	-	-	Not pyrophoric when in contact with air at ordinary temperatures; the auto-ignition temperature is 360degC (ICSC, 1999)
10	Pyrophoric solids	Not applicable	-	-	-	Classified as "liquid" according to GHS definition
11	Self-heating substances and mixtures	Classification not possible	-	-	-	Test methods applicable to liquid substances are not available
12	Substances and mixtures, which in contact with water, emit flammable gases	Not applicable	-	-	-	Containing no metals or metalloids (B, Si, P, Ge, As, Se, Sn, Sb, Te, Bi, Po, At)
13	Oxidizing liquids	Not applicable	-	-	-	Organic compounds containing oxygen (but not fluorine and chlorine), with the oxygen bound to carbon and hydrogen (but not to other elements)
14	Oxidizing solids	Not applicable	-	-	-	Classified as "liquid" according to GHS definition
15	Organic peroxides	Not applicable	-	-	-	Organic compounds containing no "-O-O-" structure
16	Corrosive to metals	Classification not possible	-	-	-	No data available. Those containing stabilizers are classified into Class 3 and Class 8 (UN#2218) (UN Recommendations on the Transport of Dangerous Goods)

Health Hazards

	Hazard class	Classification	symbol	signal word	hazard statement	Rational for the classification
1	Acute toxicity (oral)	Category 4	Exclamation mark	Warning	Harmful if swallowed	Based on the LD50 value of 900 mg/kg calculated from the testing data of rat LD50 (oral route) of 193mg/kg (EHC 191(1997)), 360mg/kg (ACGIH (7th, 2001)), 1,250mg/kg (ACGIH (7th, 2001)), 1,350mg/kg (EHC 191(1997)), 2,500mg/kg (EHC 191(1997)), 2,520mg/kg (EHC 191(1997)7), and 2,590mg/kg (ACGIH (7th, 2001)).
1	Acute toxicity (dermal)	Category 3	Skull and crossbones	Danger	Toxic in contact with skin	Based on the LD50 value of 430mg/kg calculated from the testing data of rabbit LD50 (dermal route) of 295mg/kg, 640mg/kg, 750mg/kg and 950mg/kg (EHC 191 (1997)).
1	Acute toxicity (inhalation: gas)	Not applicable	-	-	-	Due to the fact that the substance is "liquid" according to the GHS definition and inhalation of its gas is not expected.
1	Acute toxicity (inhalation: vapour)	Category 3	Skull and crossbones	Danger	Toxic if inhaled	Based on the LC50 value (4 hours) of 3.6 with >5.100 mg/L (EHC 191 (1997)), calculated from testing data of rat (inhalation of vapor), with the smaller fixed value adopted. An LC50 value (4 hours) of 3.6 mg/L is converted into 1,200 ppm, using a conversion factor of 1 mg/L = 339 ppm. Based on the rat LC50 value (4 hours) was lower than 90% of the saturated vapor concentration (5,220 ppm) under a saturated vapor pressure of 529 Pa (25degC), Acrylic acid, under the test conditions, was considered as "vapour containing substantially no mist" and was classified based on standard values expressed in ppm.
1	Acute toxicity (inhalation: dust, mist)	Category 4	Exclamation mark	Warning	Harmful if inhaled	Based on the LC50 value (4 hours) calculated from the testing data of rat LC50 (inhalation of mist) of 11.1 mg/L (1 hour) and 7.5 mg/L (2 hours) (EHC 191 (1997)). Of LC50 values of 2.8 and 3.8 mg/L (4 hours) calculated, the lower value was adopted for classification purposes.
2	Skin corrosion / irritation	Category 1A	Corrosion	Danger	Causes severe skin burns and eye damage	Based on the description in the report on rabbit skin irritation tests (EHC 191 (1997) and EU-RAR No.28 (2002)): 1-3-minitue application of the undiluted solution to the skin suggests corrosion.
3	Serious eye damage / eye irritation	Category 1	Corrosion	Danger	Causes serious eye damage	Based on the description in the report on eye irritation tests (EHC 191 (1997) and EU-RAR No.28 (2002)): cicatrices in the eyelids and corneal opacity are still evident after 20 days of the application, both of which are considered irreversible effects.
4	Respiratory/skin sensitization	Respiratory sensitization: Classification not possible Skin sensitization: Not classified	(Respiratory sensitization) - (Skin sensitization) -	(Respiratory sensitization) - (Skin sensitization) -	(Respiratory sensitization) - (Skin sensitization) -	Respiratory sensitization: No data available Skin sensitization: Based on the description in EHC 191 (1997) and EU-RAR No.28 (2002) - acrylic acid may or may not cause skin sensitization in guinea pigs. Impurities and polymerization inhibitors contained in acrylic acid cause skin sensitization, while purified acrylic acid does not, according to some reports. There is another report on industrial products containing acrylic acid that they have caused skin sensitization in more than 450 workers since 1989. Acrylic acid per se does not seem to cause skin sensitization.
5	Germ cell mutagenicity	Not classified	-	-	-	Based on the negative data on multi-generation mutagenicity tests (dominant lethal tests) and somatic cell mutagenicity tests in vivo (chromosomae aberration tests) and the absence of data on germ cell mutagenicity tests in vivo, described in EU-RAR No.28 (2002).

6	Carcinogenicity	Not classified	-	-	-	Due to the fact that the substance is classified as Category A4 by ACGIH (2001) and Group 3 by IARC (1999). This classification is in consistent with the evaluation of EU (2002): Acrylic acid is not suspected to be a carcinogenic agent (Based on these data, carcinogenic effects are not anticipated to occur.)
7	Toxic to reproduction	Not classified	-	-	-	Based on the report that no reproductive or developmental toxicity was observed at dosing levels not toxic to parent animals, described in EU-RAR No.28 (2002).
8	Specific target organs/systemic toxicity following single exposure	Category 1 (respiratory organs), Category 2 (liver)	Health hazard	Danger Warning	Causes damage to organs (respiratory organs) May cause damage to organs (liver)	Based on the animal studies including "degeneration and necrosis of liver tissue (oral route); severe irritation of respiratory organs, pulmonary inflammation (inhalation route); pulmonary edema (dermal route)" (EU-RAR No.28 (2002)). The effects on the liver and on the respiratory organs were observed at dosing levels within the guidance value ranges for Category 2 and Category 1, respectively.
9	Specific target organs/systemic toxicity following repeated exposure	Category 1 (respiratory organs)	Health hazard	Danger	Causes damage to organs through prolonged or repeated exposure (respiratory organs)	Based on the evidence from animal studies including "inflammation of the upper respiratory tract" (CERI Hazard Data 96-27 (1997)), "degeneration of the olfactory epithelia" (MOE Risk Assessment Vol. 3 (2004)). The effects were observed at dosing levels within the guidance value ranges for Category 1.
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 1	Environment	Warning	Very toxic to aquatic life	It was classified into Category 1 from 72 hours ErC50=0.13mg/L of the algae (Scenedesmus) (EHC191 (1997) and others.).
11	Hazardous to the aquatic environment (chronic)	Not classified	-	-	-	Since there was rapidly degrading (the decomposition by BOD: 67.8% (Existing Chemical Safety Inspections Data)) and the bio-accumulation was low (log Kow=0.35 (PHYSPROP Database, 2005)), it was claasified into Not classified.