

GHS Classification

ID923

2-Butenal

CAS 4170-30-3

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	-	-	-	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	Category 2	Flame	Danger	Highly flammable liquid and vapour	Flash point: <23degC. Initial boiling point: >35degC
7 Flammable solids	Not applicable	-	-	-	Liquid (GHS definition)
8 Self-reactive substances and mixtures	Not classified	-	-	-	Classified in UNRTDG Class: 6.1, Subsidiary risks Class: 3
9 Pyrophoric liquids	Not classified	-	-	-	Flash point: 230degC (Hommel, 1991 Card No.65)
10 Pyrophoric solids	Not applicable	-	-	-	Liquid (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	-	-	-	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 applicable	-	-	-	Organic compounds containing oxygen (but not chlorine and fluorine) chemically bonded only to carbon and hydrogen (but not to other elements).
14 Oxidizing solids	Not applicable	-	-	-	Liquid (GHS definition)
15 Organic peroxides	Not applicable	-	-	-	Containing no -O-O- structure
16 Corrosive to metals	Not classified	-	-	-	UNRTDG Class: 6.1, Subsidiary risks Class: 3

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	SPECIES: Rat ENDPOINT: LD50 VALUE: 220 mg/kg REFERENCE SOURCE: PATTY (4th, 1994)
1 Acute toxicity (dermal)	Category 2	Skull and crossbones	Danger	Fatal in contact with skin	Calculated based on rabbit LD50 values: 128mg/kg, 170mg/kg and 324mg/kg (PATTY 4th, 1994). The calculation value was lower than lowest value, and the lowest value of 128mg/kg was adopted. Thus it was set as Category 2.
1 Acute toxicity (inhalation: gas)	Not applicable	-	-	-	Liquid (GHS definition)
1 Acute toxicity (inhalation: vapour)	Category 1	Skull and crossbones	Danger	Fatal if inhaled	Rat LC50 values in 30 minute exposure are 600ppm (4-hour equivalent: 0.607mg/L) and 1500ppm (4-hour equivalent: 1.517mg/L) (ACGIH 7th, 2001, PATTY 4th, 1994). But it was classified based on 100ppm (equivalent 0.286mg/L): rat lethal concentration for 4 hour exposure (ACGIH 7th, 2001). 100 ppm indicates steam with almost no mist from the vapor pressure, and it was classified as Category 1 by the ppm concentration standard.
1 Acute toxicity (inhalation: dust, mist)	Classification not possible	-	-	-	No data available
2 Skin corrosion / irritation	Category 2	Exclamation mark	Warning	Causes skin irritation	It was set as Category 2 from description that it was skin irritation as effect of the humans (IARC 63 (1995)), and description that severe irritation was admitted in the test applied to the skin of the rabbit (HSDB (2005)).
3 Serious eye damage / eye irritation	Category 2A	Exclamation mark	Warning	Causes serious eye irritation	We classified it as Category 2A based on the description that the eyes of the rabbits were stimulated seriously (PATTY (4th, 1994)), and on the description that it had the ocular irritational property (IARC 63 (1995)).
4 Respiratory/skin sensitization	Respiratory sensitization: Classification not possible; Skin sensitization: Category 1	(Respiratory sensitization)-; (Skin sensitization)Exclamation mark	(Respiratory sensitization)-; (Skin sensitization)Warning	(Respiratory sensitization)-; (Skin sensitization)May cause allergic skin reaction	Respiratory organ: No data. Skin: Since IARC 63 (1995) and HSDB (2005) had respectively description of the cases which indicated sensitizing property, we classified it to be Category 1.

5	Germ cell mutagenicity	Category 1B	Health hazard	Danger	May cause genetic defects (state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard)	Since there is a positive result by the chromosome aberration test with the mouse spermatogonium using a germ cell, which is an in vivo mutagenicity test (IARC 63, 1995), it is set as Category 1B.
6	Carcinogenicity	Category 2	Health hazard	Warning	Suspected of causing cancer (state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard)	It was classified into a group 3 (IARC 63, 1995) in IARC and C (IRIS, 2005) in EPA in 1991. But it was classified into A3 in ACGIH (ACGIH 7th, 2001). So it was considered as Category 2 according to ACGIH which is latest assessment document.
7	Toxic to reproduction	Classification not possible	-	-	-	No data available
8	Specific target organs/systemic toxicity following single exposure	Category 3 (respiratory tract irritation)	Exclamation mark	Warning	may cause respiratory irritation or may cause drowsiness and dizziness (respiratory tract irritation)	From description in ACGIH (7th, 2001) and IARC 63 (1995) that an upper respiratory tracts is strongly stimulated as affect on humans, and from description that decreased respiratory rate was seen in low concentrations in the inhalation exposure test using a mouse. So it was set as Category 3 (respiratory irritant).
9	Specific target organs/systemic toxicity following repeated exposure	Not classified	-	-	-	Based on the description that significant toxicities was not observed in the 13-week oral study using the rat and mouse (IARC 63 (1995)), we classified it as Out Of Category.
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 96-hour LC50=0.072mg/L of fishes (<i>Oryzias latipes</i>) (MOE eco-toxicity tests of chemicals, 2002).
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 rapid degradability is unknown, though supposed less bioaccumulative (log Kow=0.6(PHYSROP Database, 2005)).