GHS Classification

ID778 **2-Butene, 1,4-dichloro-**

CAS 764-41-0 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	Category 3	Flame	Warning	Flammable liquid and vapour	Flash point: 59degC (ACGIH, 2001)
7	Flammable solids	Not applicable	–	–	–	Liquid (GHS definition)
8	Self-reactive substances and mixtures	Classification not possible	–	–	–	Classification not possible due to lack of data, though the substance unsaturated bonds as chemical groups with self-reactive properties present.
9	Pyrophoric liquids	Classification not possible	–	–	–	No data available
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 metaloids(B, Si, P, Ge, As, Se, Sn, Sb, Te, Bi, Po, At).
13	Oxidizing liquids	Classification not possible	–	–	–	Classification not possible due to lack of data, though containing chlorine.
14	Oxidizing solids	Not applicable	–	–	–	Liquid (GHS definition)
15	Organic peroxides	Not applicable	–	–	–	Organic compounds containing no -0-0- structure
16	Corrosive to metals	Classification not possible	–	–	–	No data available

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: 89 mg/kg REFERENCE SOURCE: ACGIH (2001)
1	Acute toxicity (dermal)	Category 3	Skull and crossbones	Danger	Toxic in contact with skin	It was set as Category 3 from the description of rabbit LD50: 733mg/kg (ACGIH (2001)).
1	Acute toxicity (inhalation: gas)	Not applicable	–	–	–	Liquid (GHS definition)
1	Acute toxicity (inhalation: vapour)	Category 1	Skull and crossbones	Danger	Fatal if inhaled	Based on the rat LC50 = 86ppm/4h (ACGIH (2001)) (in the report with priority 1), it was classified as Category 1. (The saturated vapor concentration at 20degC is 3950ppm)
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	Based on the descriptions that strong erythema, edemas and slight necrosis in rabbit examination (ACGIH (2001)), and that clear erythema, edemas, and bleeding were observed after 0.5 - 1 hour of contanct on human forearm (IUCLID (2000)), it was classified as Category 1. It was not subcategorized.
3	Serious eye damage / eye irritation	Category 1	Corrosion	Danger	Causes serious eye damage	There is the statement that in the rabbit test, the burn of an intense cornea and permanent damage (ACGIH (2001)), and skin corrosivity/irritation is Category 1. So it was set as Category 1.
4	Respiratory/skin sensitization	Respiratory sensitization: Classification not possible; Skin sensitization: Classification not	(Respiratory sensitization)-; (Skin sensitization)-	(Respiratory sensitization)-; (Skin sensitization)-	(Respiratory sensitization)-; (Skin sensitization)-	No data available

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)	We classified it as Category 1B. Based on the description that it gave positive for dominant lethality examinations by each of oral administration and inhalation exposures of the rat (IUCLID (2001)), and on the description that it gave positive in the rat chromosomal aberration test by inhalation exposure.
6	Carcinogenicity	Category 1B	Health hazard	Danger	May cause cancer (state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard)	There is a statement that carcinogenesis was acknowledged in the nose by the inhalation atmospheric exposure test of rats (ACGIH (2001)), and it being classified into A2 according to ACGIH. So it was classified into Category 1B.
7	Toxic to reproduction	Category 2	Health hazard	Warning	Suspected of damaging fertility or the undorn child	It was classified into Category 2 because of being the literature of priority 2, based on that abnormalities such as reduction of RNA and DNA of sperm, reduction of spermatocyte, spermatid and floating sperm, necrosis of spermatogenic epithelium cells etc. were observed, and the increase of death after implantation and of the length of head and tail in live fetuses in copulation with untreated female were observed in male rat oral administration and inhalation test (IUCLID (2000)), in the inhalation exposure test to pregnant rat, the increase of death after implantation, absorption through the different day during pregnancy were observed, and in all administrated group, the number of normal fetus was less than control group (HSDB (2005)).
8	Specific target organs/systemic toxicity following single exposure	Category 1 (respiratory, central nervous system, liver, kidneys, spleen); Category 3 (narcotic effects)	Health hazard; Exclamation mark	Danger; Warning	Cause damage to organs (respiratory, central nervous system, liver, kidneys, spleen); May cause respiratory irritation or may cause drowsiness and dizziness (narcotic effects)	In rat inhalation exposure test, within the guidance value of category 1, bleeding of lung, liver and spleen and a respiratory disturbance were seen (ACGIH (2001)). And inhalation and oral exposure in humans, a respiratory disturbance, the pain of respiratory tracts, a respiratory irritation, headach, a coma, central nervous system depressions, pulmonary congestion, and the displeasure of the alimentary system accompanied by pulmonary edemas, and also a damage comes later in the liver, kidney and heart (HSDB (2005)). So it was set into Category 1 (the respiratory systems, the central nervous system, liver, kidney, spleen) and Category 3 (anesthetic actions).
9	Specific target organs/systemic toxicity following repeated exposure	Category 1 (respiratory organs, liver)	Health hazard	Danger	Causes damage to organs (respiratory organs, liver) through prolonged or repeated exposure	To a rat, in the repeated inhalation exposure of the concentration within the guidance value of Category 1, functional disorder and inflammation of a respiratory systems, such as a nose, a respiratory tract, a bronchus and lungs was stated (ACGIH (2001),(IUCLID (2000)) and therefore, it was classified into Category 1 (respiratory system). According to the statement of the functional disorder of liver in repetitive oral administration to a rat of with concentration within the guidance value of Category 1(RTECS (2004)) , it was classified into Category 1(liver).
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=0.42mg/L of fishes (Bluegill) (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, supposed not rapidly degrading (BIOWIN), though supposed less bioaccumulative (log Kow=2.6(PHYSPROP Database, 2005)).