

GHS Classification

ID14

Epichlorohydrin

CAS 106-89-8

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 31degC (c.c.) (ICSC, 2003), which is classified into Category 3. Classified into Class 3 and Division 6.1 (UN#2023) (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	Not classified	-	-	-	Classified into Class 3 and Division 6.1 (UN#2023) (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 395degC (ICSC, 2003)
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 and chlorine (but not fluorine), with the oxygen and chlorine bound to carbon and hydrogen, respectively (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	Not classified	-	-	-	Classified into Class 3 and Division 6.1 (UN#2023) (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 3	Skull and crossbones	Danger	Toxic if swallowed	Based on the rat LD50 (oral route) value of 90mg/kg representing the lower of the two testing data, 90mg/kg (MOE Risk Assessment vol. 1, 2002) and 260mg/kg (EHC 33 (1984)).
1 Acute toxicity (dermal)	Category 3	Skull and crossbones	Danger	Toxic in contact with skin	Based on the testing data of rabbit LD50 (dermal route) of 754mg/kg (EHC 33 (1984)).
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 2	Skull and crossbones	Danger	Fatal if inhaled	Based on the LC50 value (4 hours) of 250ppm, calculated from the testing data of rat LC50 (inhalation of vapour) of 0.95mg/L (4 hours) (MOE Risk Assessment vol. 1 (2002)) and 2.4mg/L (4 hours) (EHC 33 (1984)), was lower than 90% of the saturated vapour concentration (16,000ppm) under a saturated vapour pressure of 1.6kPa (20degC) (ICSC (2003)), the substance was considered as "vapour containing substantially no mist" and was classified based on standard values expressed in ppm.
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 testing data of rabbit skin irritation tests (CERI-NITE Hazard Assessment No.74 (2004)) and data on human health effects (CERI-NITE Hazard Assessment No.74 (2004), ACGIH (7th, 2001), MOE Risk Assessment Vol. 1 (2002)) suggesting the substance is "corrosive," although the substance should be placed in Category 1A from the viewpoint of safety.
3 Serious eye damage / eye irritation	Category 1	Corrosion	Danger	Causes serious eye damage	Based on the testing data of rabbit eye irritation tests (CERI-NITE Hazard Assessment No.74 (2004)) and data on human health effects (ACGIH (7th, 2001), MOE Risk Assessment Vol. 1 (2002), EHC 33 (1984)), the substance is considered "extremely irritating." Although no data are available on the corrosiveness, the results of rabbit eye irritation tests suggest that 80% epichlorohydrin causes "severe irritation (corneal damage)": 100% epichlorohydrin may be corrosive.
4 Respiratory/skin sensitization	Respiratory sensitization: Category 1 Skin sensitization: Category 1	(Respiratory sensitization) Health hazard (Skin sensitization) Exclamation mark	(Respiratory sensitization) Danger (Skin sensitization) Warning	(Respiratory sensitization) May cause allergic or asthmatic symptoms or breathing difficulties if inhaled (Skin sensitization) May cause allergic skin reaction	Respiratory sensitization: Based on the description in MOE Risk Assessment Vol. 1 (2002): "The data on human health effects include chronic asthmatic bronchitis." The substance is thus considered to cause "respiratory sensitization." Skin sensitization: Classified into Category 1, based on the testing data of guinea pig skin sensitization tests (CERI-NITE Hazard Assessment No.74 (2004)) and data on human health effects (CERI-NITE Hazard Assessment No.74 (2004), ACGIH (7th, 2001), MOE Risk Assessment Vol. 1 (2002), EHC 33 (1984)). The substance is considered to cause "skin sensitization."

5	Germ cell mutagenicity	Category 2	Health hazard	Warning	Suspected of causing genetic defects	Based on negative data on multi-generation mutagenicity tests in vivo, the absence of data on germ cell mutagenicity tests in vivo, positive data on somatic cell mutagenicity tests in vivo (chromosome aberration tests), and absence of data on germ cell genotoxicity tests in vivo, described in CERI-NITE Hazard Assessment No.74 (2004).
6	Carcinogenicity	Category 1B	Health hazard	Danger	Suspected of causing cancer	Due to the fact that the substance is classified as Category R by NTP (2005) and Group 2A by IARC (1999).
7	Toxic to reproduction	Category 2	Health hazard	Warning	Suspected of damaging fertility or the unborn child	Based on the description in rat toxicity studies (CERI-NITE Hazard Assessment No.74 (2004)): Reproductive toxicity is observed (female infertility), while other toxicities are unknown.
8	Specific target organs/systemic toxicity following single exposure	Category 1 (respiratory organs, liver, kidneys)	Health hazard	Danger	Causes damage to organs (respiratory organs, liver, kidneys)	Based on the human evidence including "irritation to the eye and larynx (observed at 151 mg/m ³ , which continues for 48 hours)" (CERI-NITE Hazard Assessment No.74 (2004)), "irritation to the larynx, enlargement of the liver associated with jaundice, hepatic fatty degeneration associated with hepatopathy (observed even after two years of exposure), chronic asthmatic bronchitis" (CERI Hazard Assessment 96-48 (1998)), and the evidence from animal studies including "necrosis and ulceration of the respiratory tract and olfactory epithelia, exfoliation and hyperplasia of the tract epithelium, exfoliation of bronchiole epithelium, renal failure, an increase in the relative weight of the kidneys, an increase in urinary specific gravity, polyuria associated with an increase in urinary protein/chloride concentrations; renal damage associated with vacuolation, hepatic fatty degeneration, focal necrosis of the gastrointestinal tract" (CERI-NITE Hazard Assessment No.74 (2004)). The effects on respiratory organs and kidneys of experimental animals were observed at dosing levels within the guidance value ranges for Category 1.
9	Specific target organs/systemic toxicity following repeated exposure	Category 1 (respiratory organs, kidneys, heart, central nervous system)	Health hazard	Danger	Causes damage to organs through prolonged or repeated exposure (respiratory organs, kidneys, heart, central nervous system)	Based on the evidence from animal studies including "renal tubular dilation, renal tubular degeneration, turbinate respiratory epithelium inflammation, localized inflammation, hyperplasia, squamous metaplasia, changes in the respiratory epithelium" (CERI-NITE Hazard Assessment No.74 (2004)), "pulmonary emphysema, pulmonary edema, bronchial pneumonia, cloudy swelling of proximal convoluted renal tubules, hemorrhage and congestion in the cardiac interstitium, lesions in the hindbrain, Ammon's horn (the hippocampus) and cerebellum" (CERI Hazard Data 96-48 (1998)). 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 3	-	-	Harmful to aquatic life	It was classified into Category 3 from 96 hours LC50=10600microg/L of the fish (Fathead Minnows) (MOE Risk Assessment vol. 1 (2002) and others.).
11 Hazardous to the aquatic environment (chronic)	Not classified	-	-	-	Since there was rapidly degrading (the decomposition by BOD: 67.9% (Existing Chemical Safety Inspections Data)) and the bio-accumulation was low (log Kow=0.45 (PHYSPROP Database, 2005)), it was classified into Not classified.