

GHS Classification

ID12

Ethylene oxide

CAS 75-21-8

Date Classified: Mar. 23, 2006 (Environmental Hazards: Feb. 10, 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	-	-	-	Classified as "gas" according to GHS definition
2 Flammable gases	Category 1	Flame	Danger	Highly combustible/flammable gas	The lower explosion limit is 3 volume % (ICSC 2004)- i.e., Category 1. Classified into Division 2.1 and Division 2.3 (UN# 1040), according to UN Recommendations on the Transport of Dangerous Goods.
3 Flammable aerosols	Not applicable	-	-	-	Not aerosol products
4 Oxidizing gases	Not classified	-	-	-	Classified into Division 2.1 and Division 2.3 (UN#1040) (UN Recommendations on the Transport of Dangerous Goods)
5 Gases under pressure	Liquefied gas	Gas cylinder	Warning	High-pressure gases: explosive if heated	The boiling point is 11degC (ICSC 2004), and the critical temperature is 196degC(HSDB 2005) -- i.e., liquefied gases. Classified into Category 2.1 and Category 2.3 (UN# 1040) (UN Recommendations on the Transport of Dangerous Goods)
6 Flammable liquids	Not applicable	-	-	-	Classified as "gas" according to GHS definition
7 Flammable solids	Not applicable	-	-	-	Classified as "gas" according to GHS definition
8 Self-reactive substances and mixtures	Not applicable	-	-	-	Classified as "gas" according to GHS definition
9 Pyrophoric liquids	Not applicable	-	-	-	Classified as "gas" according to GHS definition
10 Pyrophoric solids	Not applicable	-	-	-	Classified as "gas" according to GHS definition
11 Self-heating substances and mixtures	Not applicable	-	-	-	Classified as "gas" according to GHS definition
12 Substances and mixtures, which in contact with water, emit flammable gases	Not applicable	-	-	-	Classified as "gas" according to GHS definition
13 Oxidizing liquids	Not applicable	-	-	-	Classified as "gas" according to GHS definition
14 Oxidizing solids	Not applicable	-	-	-	Classified as "gas" according to GHS definition
15 Organic peroxides	Not applicable	-	-	-	Classified as "gas" according to GHS definition
16 Corrosive to metals	Classification not possible	-	-	-	Test methods applicable to gaseous substances are not 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	Based on the rat LD50 (oral route) value of 72mg/kg representing the lower of the two testing data, 330mg/kg (CaPSAR, 1999) and 72mg/kg (MOE Risk Assessment Vol. 2, 2003).
1 Acute toxicity (dermal)	Classification not possible	-	-	-	No data available
1 Acute toxicity (inhalation: gas)	Category 3	Skull and crossbones	Danger	Toxic if inhaled	Based on the rat LC50 (inhalation route) value of 800ppm representing the lower of the two testing data, 1,460ppm (CaPSAR, 1999) and 800ppm ((MOE Risk Assessment Vol. 2, 2003).
1 Acute toxicity (inhalation: dust, mist)	Not applicable	-	-	-	Due to the fact that the substance is "gas" according to the GHS definition and inhalation of its vapour is not expected.
1 Acute toxicity (inhalation: dust, mist)	Not applicable	-	-	-	Due to the fact that the substance is "gas" according to the GHS definition and inhalation of its dust/mist is not expected.
2 Skin corrosion / irritation	Category 2	Exclamation mark	Warning	Causes skin irritation	Based on the evidence of "inflammatory edema" from the rabbit skin irritation study (CERI-NITE Hazard Assessment, 2005) and the EU Risk Phrase.
3 Serious eye damage / eye irritation	Classification not possible	-	-	-	Although the substance is classified as Category 2 according to EU Risk Phrase and is anticipated to be an irritant based on the rabbit irritation study, the method and the test duration were different from those in normal procedures.
4 Respiratory/skin sensitization	Respiratory sensitization: Classification not possible Skin sensitization: Classification not possible	-	-	-	Respiratory sensitization: No data available Skin sensitization: Insufficient data available.
5 Germ cell mutagenicity	Category 1B	Health hazard	Danger	May cause genetic defects	Based on the positive data on heritable germ cell mutagenicity tests (dominant lethal mutation tests) described in CERI-NITE Hazard Assessment (No.36, 2005) and CICAD 54 (2003).
6 Carcinogenicity	Category 1B	Health hazard	Danger	May cause cancer	Due to the fact that the substance is classified as Category A2 by ACGIH (2002).
7 Toxic to reproduction	Category 1B	Health hazard	Danger	May damage fertility or the unborn child	Based on the evidence of adverse effects on fetal growth at dosing levels not causing abnormal production of male gametes and not toxic to dams, described in CERI-NITE Hazard Assessment (No. 36, 2005) and CICAD 54 (2003).
8 Specific target organs/systemic toxicity following single exposure	Category 1 (central nervous system) Category 3 (respiratory tract irritation)	Health hazard	Danger	May cause damage to organs (central nervous system) and irritation of respiratory organs	Based on the human evidence including "airway irritation", "acute effects on the nervous system represented as nausea, vomiting and headache accompanying almost every case of inhalation exposure, and less frequent cases of impaired consciousness (including one case of coma), excitement, insomnia, weakness, diarrhea and abdominal discomfort" (EHC 55, 1985) and the evidence from animal studies including "dyspnea, watery eyes, poor coordination, clouding of consciousness and diarrhea" (NTP TR326, 1987). The effects on experimental animals were observed at dosing levels within the guidance value range for Category 1.

9	Specific target organs/systemic toxicity following repeated exposure	Category 1 (central nervous system, peripheral nervous system, blood) Category 2 (kidneys, respiratory organs)	Health hazard	Danger	Causes damage to organs (central/peripheral nervous systems, blood system) and may cause damage to organs (kidneys, respiratory organs) through prolonged or repeated exposure	Based on the human evidence including "degeneration of the myelin sheath and axon of the sural nerve", "polyneuropathy (mainly characterized by sensory impairment in the lower limbs and unsteady gait)", "declined performance in all psychomotor tests, significantly declined performance in eye-hand coordination test compared to the non-exposed group", "significantly declined performance in various psychomotor skill tests, dysgnosia" and "decreases in hematocrit and hemoglobin (CERI-NITE Hazard Assessment No.36, 2005) and the evidence from animal studies including "axonal dystrophy in the gracile nucleus of the medulla oblongata, demyelination of the axon terminal of the gracilis, atrophy of skeletal muscles", "ataxia in the hind limbs, axonal degeneration in the myelinated fibers in the nerves of the hind limbs, decreases in RBC, Hb, Ht, bone marrow cell density and lymphocyte count, renal tubular degradation, necrosis of lymphocytes in the spleen and thymus gland, rhinitis" (CERI-NITE Hazard Assessment No.36, 2005). The effects on the central nervous system and blood system of the experimental animals were observed at dosing levels within the guidance value range for Category 1, and the effects on the peripheral nervous system, kidney and respiratory organs of the experimental animals were observed at dosing levels within the guidance value range for Category 2.
10	Aspiration hazard	Not applicable	-	-	-	Not applicable

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=84mg/L of the fish (Fathead Minnows) (EHC55 (1985) and others.).
11 Hazardous to the aquatic environment (chronic)	Not classified	-	-	-	Since there was rapidly degrading (the decomposition by BOD: 107% (Existing Chemical Safety Inspections Data)) and the bio-accumulation was low (log Kow=-0.3 (PHYSPROP Database, 2005)), it was classified into Not classified.