

GHS Classification

ID66

CAS 822-06-0

Physical Hazards

Hexamethylene diisocyanate

Date Classified: Jul. 24, 2006 (Environmental Hazards: Mar. 31, 2006)

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	Not classified	-	-	-	The flash point is 140degC (open cup flash test) (ICSC (2004))
7 Flammable solids	Not applicable	-	-	-	Classified as "liquid" according to GHS definition
8 Self-reactive substances and mixtures	Not applicable	-	-	-	Containing no chemical groups with explosive or self-reactive properties
9 Pyrophoric liquids	Not classified	-	-	-	Not pyrophoric when in contact with air at ordinary temperatures: the auto-ignition temperature is 454degC (ICSC.2004)
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	Not classified	-	-	-	Classified into Division 6.1 (UN#2281) (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 747mg/kg calculated from the testing data of rat LD50 (oral route) of 738mg/kg, 960mg/kg (CERI Hazard Data 2000-50 (2001)), 746mg/kg, 959mg/kg (SIDS (2004)).
1 Acute toxicity (dermal)	Category 3	Skull and crossbones	Danger	Toxic in contact with skin	Based on the rabbit LD50 (dermal route) value of 593mg/kg (CERI Hazard Data 2000-50 (2001)) representing the lower of the two testing data, 593mg/kg and 599mg/kg (SIDS (2004)).
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 1	Skull and crossbones	Danger	Fatal if inhaled	Based on the rat LC50 (4 hours) value of 20ppm, calculated from the testing data of rat LC50 (inhalation of vapour) of 0.31mg/L (ATSDR (1998)), 0.06mg/L (MOE Risk Assessment vol. 2 (2003)), 0.124mg/L, 0.31mg/L and 0.15mg/L (SIDS (2004)), was lower than 90% of the saturated vapour concentration (70ppm) under a saturated vapour pressure of 0.007 kPa (25degC) (CERI Hazard Data 2000-50 (2001)), 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 description in the report on rabbit skin irritation tests performed in accordance with OECD Test Guideline 404 (SIDS (2004)): "skin corrosive substance." The substance should be placed in Category 1A from the viewpoint of safety if further subclassification is needed.
3 Serious eye damage / eye irritation	Category 1	Corrosion	Danger	Causes serious eye damage	Based on the description in the report on rabbit skin irritation tests performed in accordance with OECD Test Guideline 405 (SIDS (2004)): "eye corrosive substance."
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 allergy or asthma symptoms or breathing difficulties if inhaled (Skin sensitization) May cause an allergic skin reaction	Respiratory sensitization: Based on the descriptions of human health effects in CERI Hazard Data 2000-50 (2001), MOE Risk Assessment vol. 2 (2003) and ACGIH (7th, 2001): "The substance induces allergic asthma, irritable pneumonia and contact hypersensitivity." Skin sensitization: Based on the description in the report on guinea pig skin sensitization tests (SIDS (2004)): "Positive." Also due to the fact that the substance is classified into "Skin Sensitizing Substance" by the ad hoc committee of the Japanese Society of Occupational Allergy.
5 Germ cell mutagenicity	Not classified	-	-	-	Based on the absence of data on multi-generation mutagenicity tests and germ cell mutagenicity tests in vivo, and negative data on somatic cell mutagenicity tests in vivo (micronucleus tests), described in SIDS (2004).
6 Carcinogenicity	Classification not possible	-	-	-	Classification not possible given the insufficiency of data for use in classification, along with the absence of existing classification.
7 Toxic to reproduction	Not classified	-	-	-	Based on no evidence of adverse effects on reproductive capacity of parental animals and development of filial generation, described in SIDS (2004).
8 Specific target organs/systemic toxicity following single exposure	Category 1 (respiratory organs)	Health hazard	Danger	Causes damage to organs (respiratory)	Based on the evidence from animal studies: "the clinical symptoms of inhalation exposure to rats included pulmonary edema and pneumonia" (ATSDR (1998)). The effects on 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)	Health hazard	Danger	Causes damage to organs through prolonged or repeated exposure (respiratory organs)	Based on the human evidence including "eye, nasal and respiratory irritation, coughing, chest discomfort" (CERI Hazard Data 2000-50 (2001)), and the evidence from animal studies including "tracheal inflammation, turbinate epithelial necrosis, hyperplasia of squamous epithelium in turbinate," "pulmonary epidermal hyperplasia, pneumonitis, coagulation of histiocytes, degeneration of nasal olfactory epithelium, hyperkeratosis, inflammation or ulceration" following inhalation exposure to rats (CERI Hazard Data 2000-50 (2001)). The effects on experimental animals 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)	Not classified	-	-	-	It was classified into Not classified from 48 hours EC50>=89.1mg/L of the crustacea (Daphnia magna) (SIDS (2004) and others.).
11 Hazardous to the aquatic environment (chronic)	Not classified	-	-	-	Since it was not water-insolubility (the water-solubility =117mg/L (PHYSPROP Database, 2005)), and acute toxicity was low, it was classified into Not classified.