

GHS Classification

ID208

CAS 26471-62-5

Physical Hazards

Methyl-1,3-phenylene diisocyanate; m-Tolylene diisocyanate

Date Classified: Mar. 23, 2006 (Environmental Hazards: Feb. 10, 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 atom 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 flashing point of 1-methyl-2,4-phenylene-diisocyanate and 1-methyl-2,6-phenylene-diisocyanate is 127degC (ICSC (2004))
7 Flammable solids	Not applicable	-	-	-	Classified as "liquid" according to GHS definition
8 Self-reactive substances and mixtures	Not applicable	-	-	-	Containing no atom groups with explosive or self-reactive properties
9 Pyrophoric liquids	Not classified	-	-	-	Not pyrophoric when in contact with air at ordinary temperatures: the flashing point is 620degC (ICSC, 2004) for both 1-methyl-2,4-phenylene-diisocyanate and 1-methyl-2,6-phenylene-diisocyanate
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 Recommendations on the Transport of Dangerous Goods, UN#2078)

Health Hazards

Hazard class	Classification	symbol	signal word	hazard statement	Rational for the classification
1 Acute toxicity (oral)	Category 5	-	Warning	May be harmful if swallowed	Based on the LD50 value of 3,332mg/kg calculated from the testing data of rat LD50 (oral route) of 7,500mg/kg (CERI Hazard Data 97-20, 1998), 5,800mg/kg (NTP TR251, 1986) and 3,060mg/kg (EHC 75, 1987).
1 Acute toxicity (dermal)	Not classified	-	-	-	Based on the LD50 value of 10,000mg/kg calculated from the testing data of rabbit LD50 (dermal route) of 10,210mg/kg (CERI Hazard Data 97-20, 1998), 19,360 mg/kg (CERI Hazard Data 97-20, 1998) and 10,000mg/kg (EHC 75, 1987).
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 LC50 value (4 hours) of 26ppm, calculated from the testing data of rat LC50 (4 hour inhalation of dust/mist) of 0.099mg/L (CERI Hazard Data 97-20, 1998), 0.355mg/L (CERI Hazard Data 97-20, 1998), 0.34mg/L (EHC 75, 1987) and 0.355mg/L (EHC 75, 1987), was lower than 90% of the saturated vapor concentration (660 ppm) under a saturated vapour pressure of 67 Pa (25degC) (CERI Hazard Data 97-20, 1998), 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 following descriptions in DFGOT Vol. 20 (2005) suggesting its irreversible effects, although the substance should be placed in Category 1A from the viewpoint of safety: "on the surface of the skin as well as necrosis and the formation of granulomas (rabbit 24-hour skin irritation tests)" and "undiluted TDI 80/20 was evaluated as caustic. The skin was visibly healing, but the changes were not completely reversible within the follow-up period of 8 and 28days (1- or 4-hour skin irritation tests)".
3 Serious eye damage / eye irritation	Category 2A-2B	Exclamation mark	Warning	Causes severe eye irritation	Based on the evidence of "irritation and mild damage to the corneal epithelium" in rabbit eye irritation tests (CERI Hazard Data 97-20, 1998), the evidence of "immediate reaction suggestive of pain, lachrymation, swelling of the eyelids, a conjunctival reaction and mild damage to the cornea" (EHC 75, 1987) and the evidence of human health effects found in CERI Hazard Data 97-20 (1998), NTP TR 251 (1986), EHC 75 (1987), DFGOT Vol. 20 (2005) and ACGIH 7th (2004), suggesting irritation with unknown recovery time, although the substance should be placed in Category 2A from the viewpoint of safety.
4 Respiratory/skin sensitization	Respiratory sensitization: Category 1 Skin sensitization: Category 1	Health hazard	Danger	May cause allergy or asthma symptoms or breathing difficulties if inhaled, may cause allergic skin reaction	Respiratory sensitization: based on the evidence on human health effects from CERI Hazard Data 97-20 (1998), EHC 75 (1987), DFGOT Vol. 20 (2005) and ACGIH 7th (2004) and the fact that the substance is classified as "respiratory sensitizing chemicals" according to the Japanese Society of Occupational Allergy and "Respiratory Tract Group 1" according to Recommendations by the Japan Society of Occupational Health (2005). Skin sensitization: based on positive results in animal skin sensitization tests reported by CERI Hazard Data 97-20 (1998), EHC 75 (1987) and DFGOT Vol. 20 (2005), the evidence of human health effects from EHC 75 (1987), DFGOT Vol. 20 (2005) and ACGIH 7th (2004) and the fact that the substance is classified as "Skin Group 2" according to Recommendations by the Japan Society of Occupational Health (2005) and "SEN" according to ACGIH-TLV (2005).

5	Germ cell mutagenicity	Not classified	-	-	-	Based on the absence of data on heritable mutagenicity tests, germ cell mutagenicity tests in vivo, somatic cell genotoxicity tests in vivo and germ cell genotoxicity tests in vivo and negative data on somatic cell mutagenicity tests in vivo (micronucleus tests).
6	Carcinogenicity	Category 2	Health hazard	Warning	Suspected of causing cancer	Due to the fact that the substance is classified as Category A4 by ACGIH (2001), Group 2B by IARC 71 (1999) and Category 2B according to Recommendations by the Japan Society of Occupational Health (2004), and priority was given to the IARC classification, following the guidelines.
7	Toxic to reproduction	Classification not possible	-	-	-	Insufficient data available. Moreover, although nasal inflammation and relevant changes in the pharynx/trachea and weight loss were observed in the progeny at dosing levels not toxic to the parents (IRIS, 1995), the effects were not significant compared with those on the parents.
8	Specific target organs/systemic toxicity following single exposure	Category 1 (respiratory organs, central nervous system)	Health hazard	Danger	Causes damage to organs (respiratory organs, central nervous system)	Based on the human evidence including "eye/respiratory/skin irritation, severe dry cough, sputum, strangalesthesia, dyspnea, nausea, vomiting, bronchitis associated with severe bronchospasm, pulmonary edema, pneumonia, long-lasting effects on the central nervous system including headache, amnesia, loss of concentration, distraction, personality changes, easy stimulability and depression" (CERI Hazard Data 97-20, 1998), "elation, ataxia, intermittent spasm in extremities, dizziness, loss of consciousness, headache, loss of concentration, memory disorder, confusion, irritability, depression (EHC 75, 1987).
9	Specific target organs/systemic toxicity following repeated exposure	Category 1 (respiratory organs), Category 2 (liver)	Health hazard	Danger	Causes damage to organs (respiratory organs) and may cause damage to organs (liver) through prolonged or repeated exposure	Based on the human evidence including "throat irritation, dyspnea" (EHC 75, 1987) and the evidence from animal studies including "nasal inflammation, interstitial pneumonia, catarrhal bronchitis, tracheitis, bronchitis and pneumonia associating an increase of fibrous tissues in the bronchiolar wall" (CERI Hazard Data 97-20, 1998) and "pathologic changes in the lung, trachea and liver attributed to test substance administration, bronchial pneumonia, regeneration/deciliation of the bronchial epithelium, fatty liver" (Report by the Ministry of Health, Labour and Welfare, 2001). The effects on the respiratory organs and on the liver of experimental animals were observed at dosing levels within the guidance value ranges for Category 1 and Category 2, respectively.
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 hours LC50=0.153mg/L(the fish (Red sea bream)) of toluenediamine(hydrolysis product of this product) (CERI/NITE Hazard Assessment Report (preliminary version) (2006))
11 Hazardous to the aquatic environment (chronic)	Category 1	Environment	Warning	Very toxic to aquatic life with long lasting effects	Although acute toxicity is Category 1 and bio-accumulation is low (log Kow=3.74(PHYSROP Database, 2005)), since there was no rapidly degrading (the decomposition by BOD: 0%(CERI Hazard Data, 1997)), it was classified into Category 1.