

GHS Classification

ID469

Piperazine

CAS 110-85-0

Date Classified: Jul. 24, 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 "solid" according to GHS definition
3 Flammable aerosols	Not applicable	—	—	—	Not aerosol products
4 Oxidizing gases	Not applicable	—	—	—	Classified as "solid" according to GHS definition
5 Gases under pressure	Not applicable	—	—	—	Classified as "solid" according to GHS definition
6 Flammable liquids	Not applicable	—	—	—	Classified as "solid" according to GHS definition
7 Flammable solids	Not classified	—	—	—	Classified as flammable according to ICSC (2003). Classified into Class 8 (UN#2579) (UN Recommendations on the Transport of Dangerous Goods).
8 Self-reactive substances and mixtures	Not applicable	—	—	—	Containing no chemical groups with explosive or self-reactive properties
9 Pyrophoric liquids	Not applicable	—	—	—	Classified as "solid" according to GHS definition
10 Pyrophoric solids	Not classified	—	—	—	Not pyrophoric when in contact with air at ordinary temperatures: the auto-ignition temperature is 320degC (ICSC, 2003).
11 Self-heating substances and mixtures	Classification not possible	—	—	—	Test methods applicable to liquid substances are not available (melting point: 106degC (ICSC, 2003), test temperature: 140degC).
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	—	—	—	Classified as "solid" according to GHS definition
14 Oxidizing solids	Not applicable	—	—	—	Organic compounds containing no oxygen, fluorine and chlorine
15 Organic peroxides	Not applicable	—	—	—	Organic compounds containing no "O-O-" structure
16 Corrosive to metals	Classification not possible	—	—	—	Test methods applicable to solid substances are not available

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 1,280mg/kg calculated from the testing data of rat LD50 (oral route) of 600mg/kg, 11,200mg/kg (CERI Hazard Data 2001-13 (2002)), 2,830mg/kg (CERI-NITE Hazard Assessment No.19 (2005)), 2,600mg/kg (EU-RAR No.56 (2005)), 2,050mg/kg, 3,000mg/kg (PATTY (4th, 2000)) and 1,900mg/kg (DFGOT vol.9 (1998)).
1 Acute toxicity (dermal)	Category 4	Exclamation mark	Warning	Harmful in contact with skin	Based on the rabbit LD50 (dermal route) value of 1,590mg/kg representing the lower of the two testing data, 4,000mg/kg (CERI Hazard Data 2001-13 (2002)) and 1,590mg/kg (CERI-NITE Hazard Assessment No.19 (2005)).
1 Acute toxicity (inhalation: gas)	Not applicable	—	—	—	Due to the fact that the substance is "solid" according to the GHS definition and inhalation of its gas is not expected.
1 Acute toxicity (inhalation: dust, mist)	Classification not possible	—	—	—	No data available
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 (4 hour application) (CERI-NITE Hazard Assessment No.19 (2005), EU-RAR No.56 (2005) and DFGOT vol.9 (1998)): Severe irritation with irreversible effects, indicative of corrosivity. Although classified as Category 1A-1C, 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 eye irritation tests (CERI Hazard Data 2001-13 (2002), CERI-NITE Hazard Assessment No.19 (2005), PATTY (4th, 2000) and DFGOT vol.9 (1998)): "strong irritation," "severe corneal opacity" and "serious eye damage which is unlikely to heal." The substance is thus considered to possess a potential for corrosivity.
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 description of the human health effects (CERI Hazard Data 2001-13 (2002), EU-RAR No.56 (2005) and PATTY (4th, 2000)): Piperazine induced symptoms of respiratory sensitization such as asthma. Also due to the fact that the substance is classified as a "Respiratory Sensitizing Substance" by the Japanese Society of Occupational Allergy. Skin sensitization: Based on the descriptions of the human health effects (CERI Hazard Data 2001-13 (2002), EU-RAR No.56 (2005), CERI-NITE Hazard Assessment No.19 (2005) and PATTY (4th, 2000)): the substance showed "positive" in patch tests. Also due to the fact that the substance is classified as a "Skin Sensitizing Substance" by the Japanese Society of Occupational Allergy.
5 Germ cell mutagenicity	Classification not possible	—	—	—	Based on the absence of data on multi-generation mutagenicity tests, germ/somatic cell mutagenicity tests in vivo and germ/somatic cell genotoxicity tests in vivo, and no positive data on mutagenicity tests in vitro (several indices), described in CERI-NITE Hazard Assessment No.19 (2005), NITE Initial Risk Assessment No.19 (2005) and NTP DB (Access on March 2006).
6 Carcinogenicity	Classification not possible	—	—	—	Classification not possible based on expert judgment in the absence of existing classification.
7 Toxic to reproduction	Classification not possible	—	—	—	Insufficient data available

8	Specific target organs/systemic toxicity following single exposure	Category 2 (nervous system, respiratory organs)	Health hazard	Warning	May causes damage to organs (nervous system, respiratory organs)	Based on the human evidence including "somnolency, nausea or vomiting" (RTECS (2004)), "corrosive to the eye, skin and respiratory tract; adversely affects the nervous system; ingestion of large doses may cause functional impairment of the organs involved and can result in loss of consciousness" (ICSC (J) (2003)).
9	Specific target organs/systemic toxicity following repeated exposure	Category 1 (nervous system, respiratory organs)	Health hazard	Danger	Causes damage to organs through prolonged or repeated exposure (nervous system, respiratory organs)	Based on the human evidence including "headache, nausea, vomiting, diarrhea, lethargy, tremor, incoordination and muscle weakness" (CERI Hazard Data 2001-13 (2002)), and "chronic bronchitis" (CERI-NITE Hazard Assessment No.19 (2005)).
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 48 hours EC50=21mg/L of the crustacea (Daphnia magna) (EU-RAR, 2004).
11 Hazardous to the aquatic environment (chronic)	Not classified	-	-	-	Although the acute toxicity was Category 3, judging from the NOEC=12.5mg/L during 21 days of the crustacea (Daphnia magna) (EU-RAR, 2004), it was classified into Not classified.