

GHS Classification

ID58

o-Phenylenediamine

CAS 95-54-5

Date Classified: Aug. 22, 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 ICSG (2004). Classified into Division 6.1 (UN#1673 (o-m-p)) (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	—	—	—	Classified into Division 6.1 (UN#1673 (o-m-p)) (UN Recommendations on the Transport of Dangerous Goods).
11 Self-heating substances and mixtures	Classification not possible	—	—	—	Test methods applicable to liquid substances are not available (melting point: 103-104degC (ICSC, 2002), 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 510mg/kg, calculated from the testing data of rat LD50 (oral route) of 510mg/kg, 3,000mg/kg (CERI Hazard Data 2001-31 (2002)), 660mg/kg and 1,284mg/kg (ACGIH (7th, 2001)).
1 Acute toxicity (dermal)	Classification not possible	—	—	—	Insufficient data available
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)	Category 2	Skull and crossbones	Danger	Fatal if inhaled	Based on the rat LC50 (inhalation of dust) value of 0.15mg/L (4 hours) (ACGIH (7th, 2001)).
2 Skin corrosion / irritation	Category 3	—	Warning	Causes mild skin irritation	Based on the description in the report on rabbit skin irritation tests (4 hour application) (CERI Hazard Data 99-3 (2000)): "mild irritation." Also based on the description of the human health effects (MOE Risk Assessment vol. 3 (2004)): "mildly irritating to the skin." The substance is thus classified as Category 3, though the results of a dermal irritation test in rabbits (4 hours) reported in DFGOT vol.6 (1994) suggest no irritation.
3 Serious eye damage / eye irritation	Category 2A	Exclamation mark	Warning	Causes serious eye irritation	Based on the description in the report on rabbit eye irritation tests (DFGOT vol.6 (1994), CERI Hazard Data 99-3 (2000) and ACGIH (7th, 2001)): The substance produced "mild irritation." Also based on the description of the human health effects (MOE Risk Assessment vol. 3 (2004)): "irritating to the human eye."
4 Respiratory/skin sensitization	Respiratory sensitization: Classification not possible Skin sensitization: Category 1	(Respiratory sensitization) — (Skin sensitization) Exclamation mark	(Respiratory sensitization) — (Skin sensitization) Warning	(Respiratory sensitization) — (Skin sensitization) May cause an allergic skin reaction	Respiratory sensitization: No data available Skin sensitization: Based on the positive results in a number of skin sensitization studies with guinea pigs (CERI Hazard Data 2001-31 (2002) and DFGOT vol.6 (1994)) and the evidence of skin sensitization in humans reported in MOE Risk Assessment vol. 3 (2004) and DFGOT vol.6 (1994). Furthermore due to the fact that the substance is classified as a "Skin Sensitizing Substance" by the ad hoc committee of the Japanese Society of Occupational Allergy, and "Skin Sensitizing Substance: Group 1" by the Japan Society for Occupational Health.
5 Germ cell mutagenicity	Category 2	Health hazard	Warning	Suspected of causing genetic defects	Based on negative data on multi-generation mutagenicity tests, the absence of data on germ cell mutagenicity tests in vivo and germ cell genotoxicity in vivo tests, and positive data on somatic cell mutagenicity tests in vivo (micronucleus tests and chromosome aberration tests), described in CERI Hazard Data 99-3 (2000), DFGOT vol. 2 1 (2005) and NTP DB (Access on March 2006).
6 Carcinogenicity	Category 2	Health hazard	Warning	Suspected of causing cancer	Due to the fact that the substance is classified as Category A3 by ACGIH (2001).
7 Toxic to reproduction	Not classified	—	—	—	Based on expert judgment since no evidence of reproductive toxicity was found in rat teratogenicity studies, described in MOE Risk Assessment vol. 3 (2004) and PATTY (4th, 2000).

8	Specific target organs/systemic toxicity following single exposure	Category 1 (blood system) Category 2 (respiratory organs, nervous system, kidneys, muscle, liver)	Health hazard	Danger	Causes damage to organs (blood system) May cause damage to organs (respiratory organs, nervous system, kidneys, muscle, liver)	Based on the human evidence: "the substance is irritating to the eye; slightly irritating to the skin and respiratory tract; has effects on blood and may form methemoglobin" (MOE Risk Assessment vol. 3 (2004)). "indifference, rhabdomyolysis, LDH - APAT -, elevated Aldolase Glutamat Amino Transferase, acute renal failure, popliteal discoloration, damage to the central nervous system/muscle/liver." "renal tubular degeneration, renal interstitial edema, hepatocyte necrosis and bronchial pneumonia." "auditory disturbance, dyspnea and nephropathy" (IUCILID (2000)). Also based on the evidence from animal studies including "methemoglobin formation" (ACGIH (7th, 2001)), "ataxia, changes in salivary gland function or structure, and hematuria following dermal administration" (RTECS (2005)). "slight irritation of the nasal mucosa" (DFGOT vol.13 (1999)). The effects on experimental animals were observed at dosing levels within the guidance value ranges for Categories 1 and 2.
9	Specific target organs/systemic toxicity following repeated exposure	Category 2 (respiratory organs, heart, kidneys)	Health hazard	Warning	May cause damage to organs through prolonged or repeated exposure (respiratory organs, heart, kidneys)	Based on the human evidence including "nasal congestion, nasal irritation, dyspnea, blood Heinz bodies," "angitis, right coronary artery infarction, pulmonary congestion, renal hypertrophy and glomerulonephritis" (IUCILID (2000)).
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 72 hours ErC50=0.82mg/L of the algae (Selenastrum) (MOE Eco-Toxicity Tests of Chemicals, 2001).
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=0.15(PHYSPROP Database, 2005)), since there was no rapidly degrading (the decomposition by BOD: 0%(Existing Chemical Safety Inspections Data)), it was classified into Category 1.