

GHS Classification

ID436

1,3,5,7-Tetraazatricyclo[3.3.1.1^{3,7}]decane; Hexamethylenetetramine

CAS 100-97-0

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	Category 2	Flame	Warning	Flammable solid	The substance is classified as flammable, and its powder or granules, when mixed with the air, may cause dust explosion according to ICSC (2004). Classified into Division 4.1 and Packing Group III (UN#1328) (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 390degC (ICSC, 2004).
11 Self-heating substances and mixtures	Not classified	—	—	—	Classified into Division 4.1 (UN#1328) (UN Recommendations on the Transport of Dangerous Goods)
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, though the substance acts on aluminum, according to ICSC (2004).

Health Hazards

Hazard class	Classification	symbol	signal word	hazard statement	Rational for the classification
1 Acute toxicity (oral)	Not classified	—	—	—	Based on the rat LD50 (oral route) value of 9,200mg/kg (DFGOT vol.5 (1993)).
1 Acute toxicity (dermal)	Classification not possible	—	—	—	No 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
2 Skin corrosion / irritation	Category 3	—	Warning	Causes mild skin irritation	Based on the description of the human health effects (CERI Hazard Data 96-38 (1997), MOE Risk Assessment vol. 4 (2004) and DFGOT vol.5 (1993)): "The substance slightly irritates the skin," though the results of 4 hour patch tests in rabbits suggest no evidence of irritation (DFGOT (1993)).
3 Serious eye damage / eye irritation	Category 2B	—	Warning	Causes eye irritation	Based on the description of the human health effects (MOE Risk Assessment vol. 4 (2004) and DFGOT vol.5 (1993)): "The substance slightly irritates the eye," though the results of rabbit eye irritation tests suggest no irritation (DFGOT vol.5 (1993)).
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 in the report on epidemiological studies (MOE Risk Assessment vol. 4 (2004) and DFGOT vol.5 (1993)): "Asthma-like symptoms were observed." Also based on the description in MOE Risk Assessment vol. 4 (2004): "Attacks of asthma brought on." The substance is thus considered to possess a potential for respiratory sensitization. Skin sensitization: Based on the positive results in guinea pig Maximization Tests (DFGOT vol.5 (1993)) and epidemiological evidence of skin sensitization (CERI Hazard Data 96-38 (1997), MOE Risk Assessment vol. 4 (2004) and DFGOT vol.5 (1993)).
5 Germ cell mutagenicity	Not classified	—	—	—	Based on negative data on multi-generation mutagenicity tests (dominant lethal tests) and somatic cell mutagenicity tests in vivo (chromosome aberration tests), and the absence of data on germ cell mutagenicity tests in vivo, described in PATTY (4th, 2000) and DFGOT vol.5 (1993).
6 Carcinogenicity	Classification not possible	—	—	—	Classification not possible based on expert judgment in the absence of existing classification, though CERI Hazard Data 96-38 (1997), PATTY (4th, 2000) and DFGOT vol.5 (1993) provide some toxicity data.
7 Toxic to reproduction	Category 2	Health hazard	Warning	Suspected of damaging fertility or the unborn child	Based on the evidence of slight increases in the number of pups stillborn or dying in early infancy though no treatment effects on body weights of parental animals were observed (no data on other endpoints are available) in teratogenicity studies with dogs, described in MOE Risk Assessment vol. 3 (2004), PATTY (4th, 2000) and DFGOT vol.5 (1993).
8 Specific target organs/systemic toxicity following single exposure	Classification not possible	—	—	—	No data available

9	Specific target organs/systemic toxicity following repeated exposure	Category 1 (respiratory organs, kidneys)	Health hazard	Danger	Causes damage to organs through prolonged or repeated exposure (respiratory organs, kidneys)	Based on the human evidence: "acute symptoms including respiratory depression and chest tightness" (MOE Risk Assessment vol. 2 (2003)), "cystitis, proteinuria, hematuria," "inflammation of renal tubules and renal pelvis" (CERI Hazard Data 96-38 (1997)).
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>100mg/L of the crustacea (Daphnia magna) (MOE eco-toxicity tests of chemicals, 2002).
11 Hazardous to the aquatic environment (chronic)	Not classified	—	—	—	Since it was not water-insolubility (the water-solubility =4.49*105mg/L (PHYSROP Database, 2005)), and acute toxicity was low, it was classified into Not classified.