GHS Classification

ID57 Hydrazine hydrate

CAS 7803-57-8 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 classified	-	-	-	Classification not possible, because of lack of data (though the substance is hydrazines, containing chemical groups associated with explosive properties). Classified into Division 6.1 and Class 8 (hydrazine hydrate refers to UN#2030 (aqueous solutions with a concentration of 37% by mass or more)) (UN Recommendations on the Transport of Dangerous Goods)
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	Category 4	-	Warning	Combustible liquid	The flash point is 75degC (open cup flash test) (BUA205(1996)), which is classified into Category 4. Classified into Division 6.1, Class 8 and Packing Group I-III (UN Recommendations on the Transport of Dangerous Goods) (a special provision, however, set forth that "substances assigned to Packing Group I with a flash point of less than 60degC should be labeled as "flammable liquid") (hydrazine hydrate refers to UN#2030 (aqueous solutions with a concentration of 37% by mass or more)).
7	Flammable solids	Not applicable	-	-	-	Classified as "liquid" according to GHS definition
8	Self-reactive substances and mixtures	Not classified	-	-	-	The substance is hydrazines and contains chemical groups associated with explosive properties. Classified into Division 6.1 and Class 8 (hydrazine hydrate refers to UN#2030 (aqueous solutions with a concentration of 37% by mass or more)) (UN Recommendations on the Transport of Dangerous Goods)
9	Pyrophoric liquids	Not classified	-	-	-	Classified into Division 6.1 and Class 8 (hydrazine hydrate refers to UN#2030 (aqueous solutions with a concentration of 37% by mass or more)) (UN Recommendations on the Transport of Dangerous Goods)
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	-	-	-	Inorganic compounds containing oxygen (but not halogen), with the oxygen bound to the water molecule of the hydrate (but not to other elements).
14	Oxidizing solids	Not applicable	-	-	-	Classified as "liquid" according to GHS definition
15	Organic peroxides	Not applicable	-	-	-	Not organic compounds
16	Corrosive to metals	Classification not possible	-	-	-	Cannot be classified due to lack of data, though Merck (13th,2001) reports that, as for corrosivity to stainless steel, the substance does not act on V2A, SUS304 and SUS3, but should not be used for molybdenum like SUS316. Classified into "Class 8: Corrosive Substances" by the UN Recommendations on the Transport of Dangerous Goods. However, the category includes skin corrosivity, and it is unclear whether the substance is classified as "metal" corrosive (hydrazine hydrate refers to UN#2030 (aqueous solutions with a concentration of 37% by mass or more)).

Health Hazards

Hazard class		Classification	symbol	signal word	hazard statement	Rational for the classification
1	Acute toxicity (oral)	Category 3	Skull and crossbones	Danger	Toxic if swallowed	Based on the LD50 value of 172mg/kg calculated from the testing data of rat LD50 (oral route) of 262mg/kg, 169mg/kg and 220mg/kg (the Ministry of Health, Labour and Welfare (2003)).
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 "liquid" according to the GHS definition and inhalation of its gas is not expected.
1	Acute toxicity (inhalation:	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 4-hour rabbit skin irritation test results (NITE Initial Risk Assessment No.73 (2005)): "Dermal application of 55% aqueous solution resulted in corrosion at the site of application in seven of the 11 test animals." 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	Classified as Category 1 in accordance with the technical guideline, given the fact that the substance is classified into Category 1A-1C of "skin corrosion/irritation."
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 description in NITE Initial Risk Assessment No.73 (2005) of human health effects: "Hydrazine and its salts induce contact allergy in humans." Also due to the fact that hydrazine is classified as "Skin Sensitizing Substance: Group 2"* by the Japan Society for Occupational Health. *The category refers to the substance concerned and its compounds, but does not identify all substances causing respiratory/skin sensitization.
5	Germ cell mutagenicity	Category 2	Health hazard	Warning	Suspected of causing genetic defects	Based on the absence of data on multi-generation mutagenicity tests, germ cell mutagenicity tests in vivo and germ cell genotoxicity tests in vivo, and positive data on somatic cell mutagenicity tests in vivo (mouse spot tests), described in CERI-NITE Hazard Assessment No.73 (2004) and EHC 68 (1987).
6	Carcinogenicity	Classification not possible	-	-	-	Classification not possible based on expert judgment, given the absence of existing classification. As for the carcinogenicity, refer to "ID56, Hydrazine, CAS: 302-01-2."

7	Toxic to reproduction	Classification not possible	-	-	-	Insufficient data available As for the health hazards, refer to "ID56, Hydrazine, CAS: 302-01-2."
8	Specific target organs/systemic toxicity following single exposure	Category 1 (central nervous system, liver, kidneys)	Health hazard	Danger	Causes damage to organs (central nervous system, liver, kidneys)	Based on the human evidence: "Acute exposure to hydrazine hydrate has been known to adversely affect the central nervous system, liver and kidneys" (MOE Risk Assessment vol. 1 (2002)). Only those study reports specifying "hydrazine hydrate" as the test substance were used as a basis for classification. However, hydrazine monohydrate is easily formed when hydrazine (ID: 0056, CAS No.302-01-2) comes in contact with water. Hence, an aqueous solution of hydrazine often used in animal studies is also considered to be "hydrazine (mono)hydrate." Therefore, in evaluating hydrazine monohydrate, it is advised to refer to "hydrazine" (ID 0056, CAS No.302-01-2) as well.
9	Specific target organs/systemic toxicity following repeated exposure	Category 1 (liver, nervous system, gastrointestinal tract, kidneys)	Health hazard	Danger	Causes damage to organs through prolonged or repeated exposure (liver, nervous system, gastrointestinal tract, kidneys)	Based on the human evidence including "hepatic toxicity, neurological symptoms and heart symptoms," "jaundice, severe nephritis, renal tubular necrosis, glomerulonephritis and focal hepatocyte necrosis were observed at necropsy" (CERI-NITE Hazard Assessment No.78 (2004)), "gastritis, tremor, lethargy, loss of consistency in speech and behaviour, jaundice, readily palpable hepatic hypertrophy, elevated blood bilirubin/creatinine levels, albuminuria; severe renal tubular necrosis was found at autopsy" (IARC (1987)). Only those study reports specifying "hydrazine hydrate" as the test substance were used as a basis for classification. However, hydrazine monohydrate is easily formed when hydrazine (ID: 0056, CAS No.302-01-2) comes in contact with water. Hence, an aqueous solution of hydrazine often used in animal studies is also considered to be "hydrazine (mono)hydrate." Therefore, in evaluating hydrazine monohydrate, it is advised to refer to "hydrazine" (ID 0056, CAS No.302-01-2) as well.
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=0.19mg/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=-2.07(PHYSPROP Database, 2005)), since there was no rapidly degrading (the decomposition of hydrazine by BOD: 2%(Existing Chemical Safety Inspections Data)), it was classified into Category 1.