

GHS Classification

ID49

Nickel carbonyl

CAS 13463-39-3

Date Classified: Mar. 23, 2006 (Environmental Hazards: Feb. 10, 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 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	Category 2	Flame	Danger	Highly flammable liquid and vapour	The flashing point is -20degC (ICSC, 2002) (closed cup flash test) and the boiling point is 43degC which is classified into Category 2. Classified into Class 3 and Category 6.1 (UN#1259) (UN Recommendations on the Transport of Dangerous Goods)
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	—	—	—	Classified into Class 3 and Category 6.1 (UN#1259) (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 classified	—	—	—	Stable to water; insoluble (ICSC, 2002)
13 Oxidizing liquids	Not applicable	—	—	—	Organic compounds containing no oxygen, fluorine and chlorine
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	Classification not possible	—	—	—	Test methods applicable to gaseous substances are not available - boiling point: 43degC (ICSC,2002), test temperature: 55degC

Health Hazards

Hazard class	Classification	symbol	signal word	hazard statement	Rational for the classification
1 Acute toxicity (oral)	Classification not possible	—	—	—	No data available
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: vapour)	Category 1	Skull and crossbones	Danger	Fatal if inhaled	Based on the rat LC50 (4 hours) value of 12ppm, calculated from the testing data of rat LC50 (inhalation of vapour) of 35ppm (0.5 hours), was lower than 90% of the saturated vapor concentration (528,000ppm) under a saturated vapour pressure of 400mmHg (25.8degC) (equivalent to 53,300Pa at 25.8degC) (HSDB, 2005), 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 2	Exclamation mark	Warning	Causes skin irritation	Based on the following human evidence found in EHC 108 (1991): "Primary skin irritation reactions to nickel salts in solution were observed when human volunteers were patch tested. When aqueous solutions of nickel chloride were applied to the back, the threshold concentrations for irritancy were 1% with occlusion and 10% without occlusion."
3 Serious eye damage / eye irritation	Category 1	Corrosion	Danger	Causes severe eye damage	Based on the following human evidence found in HSDB, 2005: "Vapor is irritating to eyes, nose, and throat. Liquid will burn the skin and eyes", which should be considered as "irreversible damage to eyes" from the viewpoint of safety.
4 Respiratory/skin sensitization	Respiratory sensitization: Category 1 Skin sensitization: Classification not possible	(Respiratory sensitization) Health hazard (Skin sensitization) —	(Respiratory sensitization) Danger (Skin sensitization) —	(Respiratory sensitization): may cause allergy or asthma symptoms or breathing difficulties if inhaled (Skin sensitization) —	Respiratory sensitization — based on the following epidemiological observation provided by EHC 108 (1991): "A chemical engineer, who had been exposed for a long period to low levels of nickel carbonyl, developed asthma and Löffler's syndrome. In addition to pulmonary infiltrations and eosinophilia, which are markers in Löffler's syndrome, the patient had an eczematous dermatitis of the hands." Skin sensitization: No data available
5 Germ cell mutagenicity	Classification not possible	—	—	—	Based on the absence of data on heritable mutagenicity tests, germ/somatic cell mutagenicity tests in vivo and in vitro mutagenicity tests and positive data on somatic cell genotoxicity tests in vivo (DNA binding tests), described in EHC 108 (1991) and IARC 49 (1990).
6 Carcinogenicity	Category 1A	Health hazard	Danger	May cause cancer	Due to the fact that the substance is classified as Group 1 (as nickel compounds) by IARC(1990)and Category K by NTP (2005).
7 Toxic to reproduction	Category 2	Health hazard	Warning	May damage fertility or the unborn child	Based on the evidence of malformations (anophthalmia, microphthalmia, cystic lung, hydronephrosis, exencephalia, fused ribs and cleft palate), and hemorrhage in the chorionic cavity in teratogenicity tests on rats and guinea pigs, described in IARC 49 (1990) and EHC 108 (1990), and the absence of description of the effects on parent animals.

8	Specific target organs/systemic toxicity following single exposure	Category 1 (central nervous system, liver, respiratory organs, kidneys, adrenal, heart, spleen, pancreas)	Health hazard	Danger	Causes damage to organs (central nervous system, liver, respiratory organs, kidneys, adrenal, heart, spleen, pancreas)	Based on the human evidence including "frontal headache, dizziness, nausea, vomiting, insomnia, irritation followed by pulmonary symptoms" and "parenchymatous degeneration in the liver, kidneys, adrenal and spleen, cerebral edema and dot hemorrhage in the brain" (EHC 108, 1991) and the evidence from animal studies including "interstitial pneumonitis associated with focal atelectasis and necrosis, parenchymatous degeneration associated with focal necrosis in the liver, spleen, kidneys and pancreas" and "inflammation, atelectasis and interstitial fibroplasia in the lungs; congestion and hemorrhage in the kidney and adrenal" (CICAD 61, 2004). The effects on experimental animals were observed at dosing levels within the guidance value ranges for Category 1.
9	Specific target organs/systemic toxicity following repeated exposure	Classification not possible	—	—	—	No data available
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)	Classification not possible	-	-	-	No data available
11 Hazardous to the aquatic environment (chronic)	Classification not possible	-	-	-	No data available