

## GHS Classification

**ID842**

**Tetrahydrofuran**

**CAS 109-99-9**

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	-	-	-	There are no chemical groups associated with explosive properties present in the molecules.
2 Flammable gases	Not applicable	-	-	-	Liquid (GHS definition)
3 Flammable aerosols	Not applicable	-	-	-	Not aerosol products
4 Oxidizing gases	Not applicable	-	-	-	Liquid (GHS definition)
5 Gases under pressure	Not applicable	-	-	-	Liquid (GHS definition)
6 Flammable liquids	Category 2	Flame	Danger	Highly flammable liquid and vapour	Flash point: <23degC, Initial boiling point: >35degC, UNRTDG Class: 3, PG II
7 Flammable solids	Not applicable	-	-	-	Liquid (GHS definition)
8 Self-reactive substances and mixtures	Not applicable	-	-	-	There are no chemical groups associated with explosive or self-reactive properties present in the molecule.
9 Pyrophoric liquids	Not classified	-	-	-	The ignition points is 321 degC (incompatible hazards Hb (2nd edition, 1997) p391).
10 Pyrophoric solids	Not applicable	-	-	-	Liquid (GHS definition)
11 Self-heating substances and mixtures	Not classified	-	-	-	UNRTDG Class: 3
12 Substances and mixtures, which in contact with water, emit flammable gases	Not applicable	-	-	-	The chemical structure of the substance does not contain metals or metalloids(B, Si, P, Ge, As, Se, Sn, Sb, Te, Bi, Po, At).
13 Oxidizing liquids	Not applicable	-	-	-	Organic compounds containing oxygen (but not chlorine and fluorine) chemically bonded only to carbon and hydrogen (but not to other elements).
14 Oxidizing solids	Not applicable	-	-	-	Liquid (GHS definition)
15 Organic peroxides	Not applicable	-	-	-	Liquid (GHS definition)
16 Corrosive to metals	Not classified	-	-	-	UNRTDG Class: 3, PG II

## 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	It was set as Category 4 based on LD50 = 1000mg/kg. This value calculated from rat oral LD50 = 1000mg/kg (CERI Hazard Data (1999)), 2045mg/kg (ACGIH (7th, 2001)), 2845mg/kg (ACGIH (7th, 2001)) and 3200mg/kg (ACGIH (7th, 2001)).
1 Acute toxicity (dermal)	Classification not possible	-	-	-	No data available
1 Acute toxicity (inhalation: gas)	Not applicable	-	-	-	Liquid (GHS definition)
1 Acute toxicity (inhalation: vapour)	Not classified	-	-	-	Rat inhalation LC50 (3 hours) = 21000ppm (CERI Hazard Data (1999)) [equivalent 61.95mg/L]. By this concentration, it was judged as steam vapor pressure. And since 4-hour equivalent was 53.65mg/L, it was classified as out of Category.
1 Acute toxicity (inhalation: dust, mist)	Classification not possible	-	-	-	No data available
2 Skin corrosion / irritation	Category 2	Exclamation mark	Warning	Causes skin irritation	It was set as Category 2 from description that there was skin irritation as affect of the humans (CERI Hazard Data (1999), ACGIH (7th, 2001)).
3 Serious eye damage / eye irritation	Category 2A	Exclamation mark	Warning	Causes serious eye irritation	Based on the description that there is irritation to the eyes as the effect of the humans (CERI Hazard Data (1999) and ACGIH (7th, 2001)), it was set as Category 2A.
4 Respiratory/skin sensitization	respiratory sensitization: Classification not possible; Skin sensitization: Not possible	(Respiratory sensitization)-; (Skin sensitization)-	(Respiratory sensitization)-; (Skin sensitization)-	(Respiratory sensitization)-; (Skin sensitization)-	Respiratory organ: No data. Skin: Based on the description that no sensitizing property was found for the mammalian toxicity test results of CERI Hazard Data (1999), we classified it as Out Of Category.
5 Germ cell mutagenicity	Not classified	-	-	-	Since chromosome aberration test on mouse bone marrow cells (CERI Hazard Data (1999) and NTP TR475 (1998)) and sister chromatid exchange test on mouse bone marrow cells (NTP TR475 (1998)), which are in vivo tests, it was classified as out of Category by the technical policy.
6 Carcinogenicity	Classification not possible	-	-	-	Classification not possible due to lack of data
7 Toxic to reproduction	Not classified	-	-	-	It was considered as out of Category based on the description of rat (CERI Hazard Data (1999) and (NTP TR475 (1998))), and the description (ACGIH (7th, 2001)), and the description that it is not reported no effects on reproductive function and potential but no report of fetal malformation in rat reproductive test (IUCALID (2000)) and it is observed of increase of dead fetuses and fetal abortion in pregnant mouse 6-17 days inhalation exposure test with dose affecting maternal animals( CERI Hazard Data (1999) and NTP (NTP DB, 2005)).

8	Specific target organs/systemic toxicity following single exposure	Category 2 (nervous system); Category 3 (respiratory tract irritation)	Health hazard	Warning	May cause damage to organs (nervous system); May cause respiratory irritation or may cause drowsiness and dizziness (respiratory tract irritation)	In inhalation exposure of the rat for 5000ppm 3 hours (4-hour equivalent 12.7mg/L) of CERH Hazard Data (1999), from the description that catalepsy posture, a coma, a clonic convulsion, pant breathing, and breathing difficulty were acknowledged, it was thought that it had effect on a nervous systems by the moderate exposure concentrations. And it was set as Category 2. From the descriptions that there is irritation to mucosa as affect on the humans written in CERH Hazard Data(1999) and ACGIH (7th, 2005), and vapor written in SITTIG (47th, 2002), ICSC (J) (1997), HSDB (2005), and HSFS (1997) stimulates a respiratory tracts, it was considered respiratory irritant and set as Category 3. Although there is a description (CERH Hazard Data (1999) and advice of industrial hygiene academic society (2005)) that the anesthetic actions was acknowledged in the animal experiments, it was generated only in high concentrations as compared with the acute toxicities lethal doses, and it was judged as secondary effects. Moreover, in the human acute exposure, the central inhibition symptoms which suggests an anesthetic actions was not reported. And it was not thought that there was an anesthetic actions by humans.
9	Specific target organs/systemic toxicity following repeated exposure	Category 1 (liver, kidneys, nervous system)	Health hazard	Danger	Causes damage to organs (liver, kidneys, nervous system) through prolonged or repeated exposure	Based on descriptions that in occupational evidence of exposure, nephrosis, liver damage and a central spasm are observed (CERH Hazard Data (1999)), and that occupational evidence of exposure, nephrosis, liver damage, a central spasm, and peripheral neuropathy are observed (ACGIH (7th, 2001)), target organ were considered to be kidney, liver and nervous systems, and were classified into Category 1. [special notes] Although there was description that the slight obstacle at nose and tracheal epithelium was observed with 200 ppm (equivalent to 0.6 mg/L) exposure in 12-week inhalation study of rats (ACGIH (7th, 2001)); since it was slight impact, it was considered as an impact which does not
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 carried out the outside of Category from 96-hour LC50=2160mg/L of fishes (Fathead minnows), and others (CERH Hazard Data, 2000) .
11 Hazardous to the aquatic environment (chronic)	Not classified	-	-	-	Since not water-insoluble (water solubility=1.00*106mg/L(PHYSROP Database, 2005)) and acute toxicity is low.