

## GHS Classification

**ID974**

**Methyl isobutyl ketone**

**CAS 108-10-1**

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, 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	-	-	-	Flash point: 460degC (ICSC (J) (1990)
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	-	-	-	Containing no -O-O- structure
16 Corrosive to metals	Not classified	-	-	-	UNRTDG Class: 3

## Health Hazards

Hazard class	Classification	symbol	signal word	hazard statement	Rational for the classification
1 Acute toxicity (oral)	Category 5	-	Warning	May be harmful if swallowed	Rat LD50 value=2080mg/kg (CERI Hazard Data (2000), EHC 117(1990), ACGIH (7th, 2001), DFGOT vol.13 (1999), PATTY (4th 1994)), 4600mg/kg (CERI Hazard Data (2000), EHC 117(1990), DFGOT vol.13 (1999)), 4570mg/kg (EHC 117(1990)), 4500mg/kg (ACGIH (7th, 2001)), 4540mg/kg (PATTY (4th 1994)) and 3200mg/kg (PATTY (4th 1994)). Calculated based on the data above. Since the calculated values was 2919mg/kg, it was classified to category 5.
1 Acute toxicity (dermal)	Category 5	-	Warning	May be harmful in contact with skin	It was set as Category 5 based on rabbit LD50 value = 3000mg/kg (CERI Hazard Data (2000)).
1 Acute toxicity (inhalation: gas)	Not applicable	-	-	-	Solid (GHS definition)
1 Acute toxicity (inhalation: vapour)	Category 3	Skull and crossbones	Danger	Toxic if inhaled	Lower value was adopted based on rat LC50 (4 hours) = 8.2mg/L and 16.4mg/L (CERI Hazard Data (2000), EHC 117 (1990), DFGOT vol.13 (1999)). Moreover, it was classified by the ppm concentration standard, because the steam with almost free of mist from vapor pressure. The converted value is 2000ppm from the conversion coefficient, and it was classified as Category 3.
1 Acute toxicity (inhalation: dust, mist)	Classification not possible	-	-	-	No data available
2 Skin corrosion / irritation	Not classified	-	-	-	There is description that mild or very mild stimulant under a test condition severer than the OECD Guidelines was acknowledged by the test using rabbits and guinea pigs (CERI Hazard Data (2000), EHC 117 (1990), DFGOT vol.13 (1999), and PATTY (4th 1994)). But it was estimated that there is no stimulant even under a test condition severer than the OECD Guidelines in general (6 time as many valid time as this, blockade application) by the joint controlled trial using a rabbit by 23 research-institute (PATTY (4th 1994)). So it was set as the outside of Category.
3 Serious eye damage / eye irritation	Not classified	-	-	-	Although we found the descriptions that irritant property was seen in human vapor exposure examples (CERI Hazard Data (2000), EHC 117 (1990), ACGIH (7th, 2001), and PATTY (4th 1994)), we found no case reports about the case where liquid droplets entered into the eyes. On the other hand, by the Draize tests using the rabbits in ECETOC TR 48 (1992), change of the eye which suited the criteria for diagnosis of irritation was not acknowledged, and the change recovered within seven days, in addition, in the 24-institutes-joint multicenter comparison trial by the unification standard examining method using the rabbit in PATTY (4th 1994), it was estimated that it had no irritant property in 75% (18 institutes). Therefore we classified it as out of Category.

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 sensitizing property was not acknowledged by Magnusson-Kligman maximization test (test according to OECD guideline 406) using the guinea pigs in DFGOT vol.13 (1999), we classified it as Out Of Category.
5	Germ cell mutagenicity	Not classified	-	-	-	There is a negative result (CERI Hazard Data (2000), EHC 117 (1990), IRIS (2003)) by the micronucleus test which uses the mammalian erythrocyte, which is the in vivo mutagenicity test using a somatic. So it carried out the outside of Category.
6	Carcinogenicity	Not classified	-	-	-	Since it was classified into I (inadequate for an assessment of human carcinogenic potential) in EPA (2005), it was considered as the outside of Category.
7	Toxic to reproduction	Not classified	-	-	-	It was considered as Category 2 based on the description that effect was not observed in fecundity and next growth in the two-generation reproduction study of DFGOT vol.13 (1999), and the description that weight loss and ossification delays were seen but teratogenesis is observed in the fetal at the dose of the dam in toxicity of the inhalation toxicity study using pregnant rat either in CERI Hazard Data (2000), EHC 117 (1990), ACGIH (7th, 2001), DFGOT vol.13 (1999), PATTY (4th 1994), and IRIS (2003) and since reproductive toxicity in the example of human exposure was not reported.
8	Specific target organs/systemic toxicity following single exposure	Category 3 (respiratory tract irritation, narcotic effects)	Exclamation mark	Warning	May cause respiratory irritation or may cause drowsiness and dizziness (respiratory tract irritation, narcotic effects)	Because of descriptions in CERI Hazard Data (2000), EHC 117 (1990), ACGIH (7th, 2001), DFGOT vol.13 (1999), PATTY (4th 1994) and IRIS (2003) referring to confirmation of central nervous system manifestations accompanied by respiratory tract and mucosa stimulativeness and by anesthetic actions, such as headache, giddiness, nausea, etc. in human exposure cases, and of descriptions in EHC 117 (1990), PATTY (4th 1994), DFGOT vol.13 (1999) and IRIS (2003) referring to that anesthetic actions were confirmed in animal experiments. So it was considered that there were respiratory irritation and anesthetic actions, and determined to be Category 3.
9	Specific target organs/systemic toxicity following repeated exposure	Category 1 (systemic toxicity)	Health hazard	Danger	Causes damage to organs (systemic toxicity) through prolonged or repeated exposure	Based on the descriptions that various symptoms that target internal organs cannot be specified, such as, weakness, headache, burning sensation in eyes, stomachache, nausea and vomiting, and pharyngeal pain in repetitive exposure to humans (the industrial hygiene society advice (1993) p237, EHC 117 (1990), DFGOT vol.13 (1999) and CERI Hazard Data (2000)), it was judged to have systemic toxicity and was classified into Category 1.
10	Aspiration hazard	Category 2	Health hazard	Warning	May be harmful if swallowed and enters airways	Category 2 because of being a primary normal alcohol composed of carbon atoms (3<n=13) and containing an isobutyl alcohol and ketone composed of carbon atoms (n>=13).

### 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 48-hour EC50=170mg/L of Crustacea (Daphnia magna) (CERI Hazard Data, 2000).
11 Hazardous to the aquatic environment (chronic)	Not classified	-	-	-	Since not water-insoluble (water solubility=19000mg/L(PHYSPROP Database, 2005)) and acute toxicity is low.