GHS Classification

ID671 **Morpholine, 4-ethyl-**

CAS 100-74-3 Date Classified: May 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 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 3	Flame	Warning	Flammable liquid and vapour	Category 3 because of its flash point: 32 to 38degC
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: 185-240degC (ACGIH, 2001; ICSC, 2002; GESTIS, 2005)
10	Pyrophoric solids	Not applicable	–	–	–	Liquid (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	–	–	–	The chemical structure of the substance does not contain metals or metaloids(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 (but not to other elements).
14	Oxidizing solids	Not applicable	–	–	–	Liquid (GHS definition)
15	Organic peroxides	Not applicable	–	–	–	Diluent type A >=48%, Available oxygen >10% and <=10.7%, UNRTDG No.3101, Class:5.2, GHS Classification, Organic peroxides type B
16	Corrosive to metals	Classification not possible	–	–	–	Although considered as the class 8 (caustic substances) in subsidiary risks in UN No.2924 FLAMMABLE LIQUID, CORROSIVE, N.O.S.UNRTDG class 3 (subsidiary risks class 8) (pocket book (1997)), this substance seems to be considered as the class 8 since there is skin corrosivenesses (pocket book (1997)). Since there is no data about corrosion behavior, it cannot be classified.

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	From both the upper limit and lower limit of the rat 2 examination (the Health, Labor and Welfare Ministry reports (2005)) and LD50 value of ACGIH (2001), it was set as Category 4 based on LD50=1522 mg/kg calculated by the technological guideline.
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)	Category 4	Exclamation mark	Warning	Harmful if inhaled	It is thought that the inhalation test was done with vapor since saturated vapor pressure concentration of this substance is 8050ppm. Since rat LC50 value was not acquired, it was classified as Category 4 based on LC50 = 12mg/L (equivalent: 2544ppm) obtained by having converted mice LC50 value in a 2 hour inhalation test into 4 hour inhalation.
1	Acute toxicity (inhalation: dust, mist)	Classification not possible	–	–	–	Classification not possible due to lack of data
2	Skin corrosion / irritation	Category 3	–	Warning	Causes mild skin irritation	It was classified as Category 3 based on the result of "mild" in the skin irritation study on rabbits (RTECS (2004)).
3	Serious eye damage / eye irritation	Category 2B	–	Warning	Causes eye irritation	From statements that although a corneal edema was acknowledged in 40ppm, it recovered in several hours, and that although the stimulation was felt for the ophthalmic in 50-100ppm, the stimulation in 50ppm was small in humans (ACGIH (2001)), it was taken as Category 2B.
4	Respiratory/skin sensitization	Respiratory sensitization: Classification not possible; Skin sensitization: Classification not possible	(Respiratory sensitization)-; (Skin sensitization)-	(Respiratory sensitization)-; (Skin sensitization)-	(Respiratory sensitization)-; (Skin sensitization)-	No data available
5	Germ cell mutagenicity	Classification not possible	–	–	–	We have a negative result by the in vitro mutagenicity test (Health, Labor and Welfare Ministry reports (2005)), however, we found no in vivo test data. Therefore we could not classify it for the insufficiency of data.

6	Carcinogenicity	Classification not possible	–	–	–	No data available
7	Toxic to reproduction	Category 2	Health hazard	Warning	Suspected of damaging fertility or the undorn child	Based on the description of little decrease children count and live born count with dose causing slight toxicity to parent animals in rat examination (Health, Labor and Welfare Ministry reports (2005)), it is classified into Category 2.
8	Specific target organs/systemic toxicity following single exposure	Category 3 (respiratory tract irritation)	Exclamation mark	Warning	May cause respiratory irritation or may cause drowsiness and dizziness (respiratory tract irritation)	There is the description that there is the irritation to nose and throat, and appearance of cough (ACGIH (2001), HSDB (2003)), and it is classified into Category 3 (respiratory irritation). In addition, although there is the description that there is lethargica, bleary eyes in human (ACGIH (2001)), it is unknown that it is single dose or repeated dose, and it is not used to categorize because there is no detail data.
9	Specific target organs/systemic toxicity following repeated exposure	Category 2 (nervous system)	Health hazard	Warning	May cause damage to organs (nervous system) through prolonged or repeated exposure	It was classified to as Category 2 (nervous systems) based on the statement that in the dosage of guidance value within the limits of Category 2 to rat, symptoms such as cage licking, chewing behavior, tremor, momentum decreases, crouching position and ptosis etc. are observed (Health, Labor and Welfare Ministry reports (2005)). In addition, although there was a statement that lethargy or blear in his vision was observed in humans (ACGIH (2001)) , it was unknown whether it is a single dose or it was a repeated doses, and there was no detailed data, so it was not use for the classification.
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 72-hour ErC50>53mg/L of algae (Selenastrum) (MOE eco-toxicity tests of chemicals, 2002).
11	Hazardous to the aquatic environment (chronic)	Not classified	–	–	–	Since not water-insoluble (water solubility=1.00*106mg/L(PHYSPROP Database, 2005)) and acute toxicity is low.