

GHS Classification

ID958

Pentane

CAS 109-66-0

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 2	Flame	Danger	Highly flammable liquid and vapour	Flash point: <23degC. Initial boiling point: >35degC
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: 260degC (NFPA, 12th, 1997, p.325-77)
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 metalloids(B, Si, P, Ge, As, Se, Sn, Sb, Te, Bi, Po, At).
13 Oxidizing liquids	Not applicable	-	-	-	Organic compounds containing no oxygen, fluorine and chlorine.
14 Oxidizing solids	Not applicable	-	-	-	Liquid (GHS definition)
15 Organic peroxides	Not applicable	-	-	-	Containing no -O-O- structure
16 Corrosive to metals	Classification not possible	-	-	-	Liquid at a test temperature, 55degC. Test methods applicable to solid substances are not available.

Health Hazards

Hazard class	Classification	symbol	signal word	hazard statement	Rational for the classification
1 Acute toxicity (oral)	Not classified	-	-	-	After 2000mg/kg single time oral administration, no rats died and no expressed systemic toxicity. In addition, there was description that LD50 > 2000mg/kg (EU-RAR, 2003), it was considered as out of category.
1 Acute toxicity (dermal)	Classification not possible	-	-	-	Classification not possible due to lack of data
1 Acute toxicity (inhalation: gas)	Not applicable	-	-	-	Liquid (GHS definition)
1 Acute toxicity (inhalation: vapour)	Not classified	-	-	-	Based on rat LC50 (2 hours): 98662ppm (4 hour equivalent: 205.45mg/L (EU-RAR, 2003)), this concentration suggest vapor with almost no mist from its vapor pressure. So it was classified as out of Category.
1 Acute toxicity (inhalation: dust, mist)	Classification not possible	-	-	-	No data available
2 Skin corrosion / irritation	Not classified	-	-	-	It is described that there is stimulativeness, such as a pain, burning sensation, and a blister, by skin application as a volunteer (test conditions, such as dosage, were unknown) (ACGIH (7th, 2001)). But from description that there was no stimulativeness to the human skin by the 24-hour patch test in the humans (EU-RAR (2003)), and that there was no stimulativeness in practice by the skin irritation study in a rabbit (the erythema and dropsy with the average values of Draize score of 0.67), it was set as the outside of Category.
3 Serious eye damage / eye irritation	Category 2B	-	Warning	Causes eye irritation	In the eye irritation tests with the rabbits, transient conjunctivitis was admitted, however, it recovered within 72 hours (EU-RAR (2003)). So we classified it as Category 2B also based on the other descriptions.
4 Respiratory/skin sensitization	Respiratory sensitization: Classification not possible; Skin sensitization: Not classified	-	-	-	Respiratory organ: No data. Skin: Since it was indicated that there was no sensitizing property in the Maximisation Test using the guinea pigs in EU-RAR (2003), we classified it as Out Of Category.
5 Germ cell mutagenicity	Not classified	-	-	-	Since it was negative in the micronucleus test which used the rat myeloid cells of in vivo (EU-RAR, 2003), it carried out the outside of Category.
6 Carcinogenicity	Classification not possible	-	-	-	No data available

7	Toxic to reproduction	Not classified	-	-	-	There is no data of the reproductive examination using laboratory animals. However, in the 13-week repetition inhalation exposure examination using rats, the effects of administration of a substance is not observed grossly and histologically in genital tract of male and female rats in the highest exposure concentration group (20000mg/m ³ , 6 hours/day) (EU-RAR, 2003). Moreover, there is a description that no influence on dam and fetus was observed in the teratogenicity test by oral administration using rats, even at the highest dose of 1000mg/kg/day (EU-RAR, 2003). Therefore, it was out of the Category. □
8	Specific target organs/systemic toxicity following single exposure	Category 3 (narcotic effects, respiratory tract irritation)	Exclamation mark	Warning	May cause respiratory irritation or may cause drowsiness and dizziness (narcotic effects, respiratory tract irritation)	Because of a description in ACGIH (7th, 2001) referring to that there were anesthetic actions and respiratory irritant through inhalation exposure to laboratory animals, and of descriptions in ACGIH (7th, 2001), EU-RAR (2003), Patty (4th, 1994), and Japan Society for Occupational Health recommendation (1993) referring to that there were respiratory irritant and anesthetic actions through inhalation exposure to mice. So it was judged as Category 3 (anesthetic actions, respiratory irritant).
9	Specific target organs/systemic toxicity following repeated exposure	Not classified	-	-	-	In the repetitive inhalation exposure test on rats (highest exposure concentrations: 6660ppm- 6 hours/day, 5 days/week for 13 weeks and 3000 ppm- 9 hours/day, 5 days/week for 30 weeks) (EU-RAR (2003)), and 16-week repetitive inhalation exposure test on rats (the highest exposure concentrations : 3000 ppm, 12 hours/day, 7 days/week) (EU-RAR (2003), Patty (4th, 1994), and industrial hygiene society advice (1993)), it was observed no toxicity even with the highest exposure concentrations exceeding the guidance value for Category 2, and in long-term repetitive exposure of high concentration n-pentane on humans, it was reported to have no effects on central nervous systems (EU-RAR (2003)), therefore, it was classified as out of Category.
10	Aspiration hazard	Category 1	Health hazard	Danger	May be fatal if swallowed and enters airways	Since it is a hydrocarbon and the dynamic viscosity is 0.374mm ² /s at 20 degrees C (calculated from the viscosity 0.234mPs-s, and the density of 0.62624g/cm ³ at 20 degrees C), we classified it as Category 1.

Environmental Hazards

Hazard class	Classification	symbol	signal word	hazard statement	Rational for the classification
11 Hazardous to the aquatic environment (acute)	Category 2	-	-	Toxic to aquatic life	It was classified into Category 2 from 48-hour EC50=2.7mg/L of Crustacea (Daphnia magna) (EU-RAR, 2003).
11 Hazardous to the aquatic environment (chronic)	Not classified	-	-	-	Since rapidly degrading (BOD: 96% (existing chemical safety inspections data)), and less bio-accumulative (log Kow=3.39 (PHYSPROP Database, 2005)).