

GHS Classification

ID1011

1,3-Benzenediol

CAS 108-46-3

Date Classified: Jul. 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	-	-	-	Solid (GHS definition)
3 Flammable aerosols	Not applicable	-	-	-	Not aerosol products
4 Oxidizing gases	Not applicable	-	-	-	Solid (GHS definition)
5 Gases under pressure	Not applicable	-	-	-	Solid (GHS definition)
6 Flammable liquids	Not applicable	-	-	-	Solid (GHS definition)
7 Flammable solids	Not classified	-	-	-	UNRTDG Class: 6.1
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 applicable	-	-	-	Solid (GHS definition)
10 Pyrophoric solids	Not classified	-	-	-	Flash point: 585degC (Hommel, 1991, Card No.890)
11 Self-heating substances and mixtures	Classification not possible	-	-	-	Test methods applicable to liquid or solid substances at 140degC 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	-	-	-	Solid (GHS definition)
14 Oxidizing solids	Not applicable	-	-	-	Organic compounds containing oxygen (but not chlorine and fluorine) and the oxygen is chemically bonded only to carbon and hydrogen (but not to other elements).
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)	Category 4	Exclamation mark	Warning	Harmful if swallowed	Rat LD50 value: 980mg/kg (NTP TR 403, 1992, ACGIH 7th., 2001, PATTY 4th., 1994, DFGOT 20, 2003), 202mg/kg, 301mg/kg, 370mg/kg, 489mg/kg, 334mg/kg, 349mg/kg and 502mg/kg (all the data from DFGOT 20, 2003). Based on the toxicity value of 302mg/kg calculated from the data above, it was classified as category 4.
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: 3360mg/kg (NTP TR 403, 1992, and ACGIH 7th., 2001, DFGOT 20, 2003, PATTY 4th., 1994), and 3830mg/kg (DFGOT 20, 2003).
1 Acute toxicity (inhalation: gas)	Not applicable	-	-	-	Solid (GHS definition)
1 Acute toxicity (inhalation: vapour)	Classification not possible	-	-	-	No data available
1 Acute toxicity (inhalation: dust, mist)	Category 5	-	Warning	May be harmful if inhaled	Based on rat LC50 value by 1 hour exposure: 21.3mg/L (4 hour equivalent: 5.33mg/L (IUCLID 2000)), it was set as Category 5.
2 Skin corrosion / irritation	Category 2	Exclamation mark	Warning	Causes skin irritation	From statement that less to moderate irritating was acknowledged in the normal skin in 6-time-as much exposure time as a GHS definitions by the skin irritation test using a rabbit (ACGIH 7th., 2001, DFGOT 20, 2003, PATTY 4th., 1994), it was judged that the strength of skin irritation in a rabbit was moderate or weaker than that, and from statement that skin irritation was acknowledged by occupational exposure in humans (NTP TR 403, 1992, and PATTY 4th., 1994, ACGIH 7th., 2001, International Agency for Res. on Cancer 15, and 1977), it was judged that there was skin irritation in this product, and it was set as Category 2.
3 Serious eye damage / eye irritation	Category 1	Corrosion	Danger	Causes serious eye damage	We classified it as Category 1 based on the descriptions that it caused the irreversible ulcer on the cornea in the eye irritation tests using the rabbits (ACGIH 7th., 2001, DFGOT 20, 2003).
4 Respiratory/skin sensitization	Respiratory sensitization: Classification not possible; Skin sensitization: Category 1	(Respiratory sensitization)-; (Skin sensitization)Exclamation mark	(Respiratory sensitization)-; (Skin sensitization)Warning	(Respiratory sensitization)-; (Skin sensitization)May cause allergic skin reaction	Respiratory sensitization: No data. Skin sensitization : Based on the description that there were many case reports that sensitizing was acknowledged in human, and based on description that it was positive (the rate of a positive: 70%) in the test (the Maximization method) using the guinea pig (DFGOT 20, 2003, both human and animal), we classified it to be Category 1.

5	Germ cell mutagenicity	Not classified	-	-	-	From description that all are negative by the small core examination which uses the mouse and rat marrow cell which is the in vivo mutagenicity test using a somatic, and the sister chromatid exchange test using a rat marrow cell (NTP TR 403, 1992, ACGIH 7th., 2001, DFGOT 20, 2003, IARC 71, 1999), it carried out the outside of Category. In addition, in the DNA synthesis inhibitory effect test using the mouse spermary cell which is a productive cell in vivo heredity toxicity examination, it is negative (NTP TR 403, 1992, ACGIH 7th., 2001). Moreover, there is description that it is positive in the chromosomal aberration test and gene mutation assay using a mammalian cultured cell among the in vitro mutagenicity test (NTP TR 403, 1992, ACGIH 7th., 2001, DFGOT 20, 2003, IARC 71, 1999, NTP DB 2006), and it is negative in the mutation examination using bacteria (NTP TR 403, 1992, ACGIH 7th., 2001, DFGOT 20, 2003, IARC 15, 1977).
6	Carcinogenicity	Not classified	-	-	-	It was considered as the outside of Category based on being classified into Group 3 (IARC 71, 1999) in IARC, A4 (ACGIH 7th,2001) in ACGIH.
7	Toxic to reproduction	Classification not possible	-	-	-	It cannot be classified due to the unknown effects on the generative function etc., although in the study it was administered orally to the fetal organ formative period in the pregnant rat and mouse, and fetus toxicity and teratogenicity were not observed even in the dose which indicates inhibition of weight gains to dam (NTP TR 403, 1992; ACGIH 7th., 2001; DFGOT 20, 2003; IARC 71, 1999).
8	Specific target organs/systemic toxicity following single exposure	Category 1 (blood system, central nervous system, respiratory organs, cardiovascular system)	Health hazard	Danger	Cause damage to organs (blood system, central nervous system, respiratory organs, cardiovascular system)	It was judged that the target organs of this substance were blood, central nervous system, respiratory system and cardio-vascular system because it is reported that oral inoculation or percutaneous exposure may cause death in humans after showing restlessness, methemoglobinemia, cyanosis, dizziness, drowsiness, convulsions, tachycardia, dyspnea, decrease of body temperature, decrease of blood pressure and respiratory rate, and jaundice (PATTY 4th., 1994). So it was classified as Category 1 (blood, central nervous system, respiratory system, cardio-vascular system).
9	Specific target organs/systemic toxicity following repeated exposure	Category 1 (thyroid gland)	Health hazard	Danger	Causes damage to organs (thyroid gland) through prolonged or repeated exposure	In the test of drinking water administration to the rat for 12 weeks, with the dosage of guidance value range of Category 1, the average height of the follicular cell of the thyroid gland increased significantly, and the mean diameter of the follicle was significantly small. Since the author considered it as the precursor stage for the onset of goiter, the effect to thyroid function was not clear, however, we judged that the thyroid might be affected and we classified it into Category 1 (thyroid).
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)	Category 3	-	-	Harmful to aquatic life	It was classified into Category 3 from 96-hour LC50=32.7mg/L of Crustacea (glass shrimp) (ECETOC TR91, 2003).
11 Hazardous to the aquatic environment (chronic)	Not classified	-	-	-	Since rapidly degrading (BOD: 66.7% (existing chemical safety inspections data)), and less bio-accumulative (log Kow=0.8 (PHYSPROP Database, 2005)).