GHS Classification

ID181 1,3-Butadiene

CAS 106-99-0 Date Classified: Apr. 20, 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	-	-	-	Classified as "gas" according to GHS definition
2	Flammable gases	Category 1	Flame	Danger	Extremely flammable gas	Based on the description in ICSC (2004): the lower explosion limit is 1.1vol%. Those containing stabilizers are classified into Division 2.1 (UN Recommendations on the Transport of Dangerous Goods, UN#1010)
3	Flammable aerosols	Not applicable	-	-	-	Not aerosol products
4	Oxidizing gases	Classification not possible	-	-	-	No data available Those containing stabilizers are classified into Division 2.1 (UN Recommendations on the Transport of Dangerous Goods, UN#1010)
5	Gases under pressure	Liquefied gas	Gas cylinder	Warning	Contains gas under pressure; may explode if heated	The boiling point is -4degC (ICSC 2004), and the critical temperature is 161.8degC (HSDB (2005)) - i.e., liquefied gas. Those containing stabilizers are classified into Division 2.1 (UN#1010)(UN Recommendations on the Transport of Dangerous Goods)
6	Flammable liquids	Not applicable	-	-	-	Classified as "gas" according to GHS definition
7	Flammable solids	Not applicable	-	-	-	Classified as "gas" according to GHS definition
8	Self-reactive substances and mixtures	Not applicable	-	-	-	Classified as "gas" according to GHS definition
9	Pyrophoric liquids	Not applicable	-	-	-	Classified as "gas" according to GHS definition
10	Pyrophoric solids	Not applicable	-	-	-	Classified as "gas" according to GHS definition
11	Self-heating substances and mixtures	Not applicable	-	-	-	Classified as "gas" according to GHS definition
12	Substances and mixtures, which in contact with water, emit flammable gases	Not applicable	-	-	-	Classified as "gas" according to GHS definition
13	Oxidizing liquids	Not applicable	-	-	-	Classified as "gas" according to GHS definition
14	Oxidizing solids	Not applicable	-	-	-	Classified as "gas" according to GHS definition
15	Organic peroxides	Not applicable	-	-	-	Classified as "gas" according to GHS definition
16	Corrosive to metals	Classification not possible	-	-	-	Test methods applicable to gaseous substances are not available.

Health Hazards

Hazard class		Classification	symbol	signal word	hazard statement	Rational for the classification
1	Acute toxicity (oral)	Classification not possible	-	-	-	Classified as "not classified," Based on the rat LD50 (oral route) of 5,480mg/kg (EU-RAR No.20 (2002)). 1,3-butadiene is a gas under ambient conditions, with its water solubility standing at 735mg/L (CERI-NITE Hazard Assessment No.9 (2005)). However, the method of oral administration is unknown and the data are not considered "reliable," hence classified as "classification not possible."
1	Acute toxicity (dermal)	Classification not possible	-	-	-	No data available
1	Acute toxicity (inhalation: gas)	Not classified	-	-	-	Based on the testing data of rat LC50 (4-hour inhalation of gas) of 129,000ppm (EU-RAR No.20 (2002)).
1	Acute toxicity (inhalation:	Not applicable	-	-	-	Due to the fact that the substance is "gas" according to the GHS definition and inhalation of its vapour is not expected.
1	Acute toxicity (inhalation: dust, mist)	Not applicable	-	-	-	Due to the fact that the substance is "gas" according to the GHS definition and inhalation of its dust/mist is not expected.
2	Skin corrosion / irritation	Classification not possible	-	-	-	Insufficient data available. Human cases are reported where exposure to 1,3-butadiene caused skin frostbite ((CERI-NITE Hazard Assessment No.9 (2005)).
3	Serious eye damage / eye irritation	Classification not possible	-	-	-	The substances is considered "irritating" to rabbit and human eyes, based on the description in EU-RAR No.20 (2002), which also indicates that standard eye irritation tests cannot be performed because butadiene is a gas under ambient conditions.
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) -	Respiratory sensitization: No data available Skin sensitization: No data available
5	Germ cell mutagenicity	Category 1B	Health hazard	Danger	May cause genetic defects	Based on positive data on multi-generation mutagenicity tests (mouse dominant lethal tests), described in EU-RAR No.20 (2002).
6	Carcinogenicity	Category 1A	Health hazard	Danger	May cause cancer	Due to the fact that the substance is classified as Category K (Known to be human carcinogens) by NTP (2005).
7	Toxic to reproduction	Classification not possible	-	-	-	Insufficient data available (no data available on the reproductive function of parent animals)
8	Specific target organs/systemic toxicity following single exposure	Category 3 (respiratory tract irritation, narcotic effects)	Exclamation mark	Warning	(Respiratory tract irritation) May cause respiratory irritation (Narcotic effects) May cause drowsiness or dizziness	Based on the human evidence including "irritation to the eyes, nasal tract, larynx and lungs, associated with cough" (CERI Hazard Data 96-21 (1997)), and the evidence from animal studies including "mild narcotic influence" (CERI-NITE Hazard Assessment No.9 (2004)).

9	Specific target organs/systemic toxicity following repeated exposure	Category 1 (ovaries) Category 2 (blood system, heart, liver, bone marrow, testes)	Health hazard	Danger Warning	Causes damage to organs through prolonged or repeated exposure (ovaries) May cause damage to organs through prolonged or repeated exposure (blood system, heart, liver, bone marrow, testes)	Based on the evidence from animal studies including "macrocytic megaloblastic anemia, ovarian atrophy, mineralization of the heart muscle, centrilobular hepatocyte necrosis, bone marrow atrophy, testis atrophy" (CERI-NITE Hazard Assessment No.9 (2004)). The effects on "ovaries" and "blood system, heart, liver, bone marrow and testes" are observed at dosing levels within the guidance value ranges for Category 1 and Category 2, respectively.
10	Aspiration hazard	Not applicable	-	-	-	Not applicable

Environmental Hazards

Hazard class		Classification	symbol	signal word	hazard statement	Rational for the classification
11	Hazardous to the aquatic environment (acute)	Classification not possible	-	-	-	Classification not possible due to lack of data
11	Hazardous to the aquatic environment (chronic)	Classification not possible	-	-	-	Classification not possible due to lack of data