

## GHS Classification

**ID873**

**Chlorine dioxide**

**CAS 10049-04-4**

Date Classified: Sep. 1, 2005 (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	-	-	-	Gas (GHS definition)
2 Flammable gases	Classification not possible	-	-	-	No data available by regulated test methods (there is a lot of information with "high explosive" and "Non-combustible")
3 Flammable aerosols	Not applicable	-	-	-	Not aerosol products
4 Oxidizing gases	Classification not possible	-	-	-	No data available by regulated test methods ("strong oxidizing agent" according to some reports)
5 Gases under pressure	Classification not possible	-	-	-	Classification not possible due to lack of data
6 Flammable liquids	Not applicable	-	-	-	Gas (GHS definition)
7 Flammable solids	Not applicable	-	-	-	Gas (GHS definition)
8 Self-reactive substances and mixtures	Not applicable	-	-	-	Gas (GHS definition)
9 Pyrophoric liquids	Not applicable	-	-	-	Gas (GHS definition)
10 Pyrophoric solids	Not applicable	-	-	-	Gas (GHS definition)
11 Self-heating substances and mixtures	Not applicable	-	-	-	Gas (GHS definition)
12 Substances and mixtures, which in contact with water, emit flammable gases	Not applicable	-	-	-	Gas (GHS definition)
13 Oxidizing liquids	Not applicable	-	-	-	Gas (GHS definition)
14 Oxidizing solids	Not applicable	-	-	-	Gas (GHS definition)
15 Organic peroxides	Not applicable	-	-	-	Gas (GHS definition)
16 Corrosive to metals	Classification not possible	-	-	-	Test methods applicable to gas substances are not available

**Health Hazards**

Hazard class	Classification	symbol	signal word	hazard statement	Rational for the classification
1 Acute toxicity (oral)	Not applicable	-	-	-	Gas (GHS definition)
1 Acute toxicity (dermal)	Not applicable	-	-	-	Gas (GHS definition)
1 Acute toxicity (inhalation: gas)	Category 1	Skin and crossbones	Danger	Fatal if inhaled	It was considered as Category 1 based on rat LC50 (4 hours) value: 32ppm (CICAD 37, 2002).
1 Acute toxicity (inhalation: dust, mist)	Not applicable	-	-	-	Gas (GHS definition)
1 Acute toxicity (inhalation: gas)	Not applicable	-	-	-	Gas (GHS definition)
2 Skin corrosion / irritation	Category 2	Exclamation mark	Warning	Causes skin irritation	It was set as Category 2 from description that the skin was stimulated seriously (ICSC (J)(1999), HSDB (2005)).
3 Serious eye damage / eye irritation	Category 2A	Exclamation mark	Warning	Causes serious eye irritation	There is the description that in evidence of exposure in humans eye irritations were acknowledged (CICAD 37 (2002)), and the description that the eyes are stimulated seriously (ICSC (J)(1999)). So it was set as Category 2A.
4 Respiratory/skin sensitization	Respiratory sensitization: Classification not possible; Skin sensitization: Classification not possible	-	-	-	No data available
5 Germ cell mutagenicity	Category 2	Health hazard	Warning	Suspected of causing genetic defects (state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard)	There are negative result with dominant lethal test on mice (CICAD 37, 2002), negative result with chromosome aberration test on mouse marrow cells, which is an in vivo mutagenicity test using somatic cells (CICAD 37, 2002, ATSDR, 2004, IRIS, 2006), and negative result with micronucleus test by oral administration which used the mouse erythrocytes (CICAD 37, 2002, ATSDR, 2004, IRIS, 2006). But there is a positive result with micronucleus test which used the mouse erythrocytes by the medication in the abdominal cavity (ACGIH 7th, 2001, PATTY 4th, 1994, ATSDR, 2004, IRIS, 2006), and there was no positive result with productive cell in vivo genotoxicity study. So it was classified as Category 2.
6 Carcinogenicity	Not classified	-	-	-	Since it was classified into Group D in EPA (IRIS, 2000), it was considered as the outside of Category.

7	Toxic to reproduction	Not classified	-	-	-	It was considered as out of Category based on the description that effect was not observed in fertility in rat one generation administration in drinking water reproduction study (CICAD 37 (2002), ATSDR (2004), and IRIS (2005)), and the description that clear reproductive toxicity was not observed in administration in drinking water test to female rat from pre-mating to pregnant period at dose causing general toxicity to maternal animals.
8	Specific target organs/systemic toxicity following single exposure	Category 1 (respiratory organs)	Health hazard	Danger	Cause damage to organs (respiratory organs)	From description in CICAD 37 (2002), ATSDR (2004), and IRIS (2005) that pulmonary edemas was seen at the concentration of the guidance value range of Category 1 in the single inhalation exposure tests which used rats, and description in ATSDR (2004) and IRIS (2005) that dyspnea and decreased respiratory function was seen in humans in evidence of exposure, respiratory systems was considered to be the target organ, and was set as Category 1.
9	Specific target organs/systemic toxicity following repeated exposure	Category 1 (respiratory organs)	Health hazard	Danger	Causes damage to organs (respiratory organs) through prolonged or repeated exposure	Based on the description that in the occupational evidence of exposure in humans, the effects on the respiratory systems were observed (ACGIH (7th, 2001), PATTY (4th, 1994), CICAD 37 (2002), ATSDR (2004), and IRIS (2005)), and the description that in the repeated inhalation exposures test using the rat and rabbit, the effects on the respiratory systems were observed with the concentration in the Category 1 guidance value range (CICAD 37 (2002), ATSDR (2004), and IRIS (2005)), it was classified into Category 1, since respiratory systems were considered to be target organs.
10	Aspiration hazard	Not applicable	-	-	-	Gas (GHS definition)

### Environmental Hazards

Hazard class	Classification	symbol	signal word	hazard statement	Rational for the classification
11 Hazardous to the aquatic environment (acute)	Category 1	Environment	Warning	Very toxic to aquatic life	It was classified into Category 1 from 96-hour LC50=0.02-0.17mg/L of fishes (Fathead minnows), and others (CICAD37, 2002).
11 Hazardous to the aquatic environment (chronic)	Category 1	Environment	Warning	Very toxic to aquatic life with long lasting effects	Classified into Category 1, since acute toxicity was Category 1, and behavior in water and bioaccumulative potential are unknown.