

4. CHEMICAL AND PHYSICAL INFORMATION

4.1 CHEMICAL IDENTITY

Information regarding the chemical identity of chlorine dioxide and sodium chlorite is located in Table 4-1. Table 4-1 lists common synonyms, trade names, and other pertinent identification information for chlorine dioxide and sodium chlorite.

4.2 PHYSICAL AND CHEMICAL PROPERTIES

Information regarding the physical and chemical properties of chlorine dioxide and sodium chlorite is located in Table 4-2. Table 4-2 lists important physical and chemical properties of chlorine dioxide and sodium chlorite, but is not intended to be all inclusive.

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Table 4-1. Chemical Identity of Chlorine Dioxide and Sodium Chlorite

Characteristic	Information	
Chemical name	Chlorine dioxide	Sodium chlorite
Synonym(s)	Alcide; Anthium dioxide; Chlorine(IV) oxide; Chlorine oxide; Chlorine peroxide; Chloroperoxide; Chloriperoxyl; Chloryl radical; Dioxide de cloro [Spanish]; Dioxide de chlore [French]; Caswell No. 179A; Doxcide 50	
Registered trade name(s)	No data	No data
Chemical formula	ClO ₂	NaClO ₂
Chemical structure	O•-Cl=O	$\text{Na}^+ \text{O}^- \text{Cl}=\text{O}$
Identification numbers:		
CAS Registry	10049-04-4	7758-19-2
NIOSH RTECS	FO3000000	VZ4800000
EPA Hazardous Waste	No data	No data
OHM/TADS	No data	No data
DOT/UN/NA/IMCO	NA 9191 (Frozen Solution)	UN 1496 (solid)/UN 1908 (solution)
HSDB	517	733
NCI	No data	No data

CAS = Chemical Abstracts Services; CIS = Chemical Information System; DOT/UN/NA/IMCO = Department of Transportation/United Nations/North America/International Maritime Dangerous Goods Code; EPA = Environmental Protection Agency; HSDB = Hazardous Substance Data Bank; NCI = National Cancer Institute; NIOSH = National Institute for Occupational Safety and Health; OHM/TADS = Oil and Hazardous Materials/Technical Assistance Data System; RTECS = Registry of Toxic Effects of Chemical Substances

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Table 4-2. Physical and Chemical Properties of Chlorine Dioxide and Sodium Chlorite

Property	Chlorine dioxide	Sodium chlorite
Molecular weight (g/mol)	67.452 ^a	90.45 ^b
Color	Yellow to reddish-yellow ^c	White ^b
Physical state	Gas ^c	Solid ^c
Melting point	-59 °C ^c	180–200° C (decomposes) ^c
Boiling point	11 °C ^c	Decomposes ^c
Density	1.640 g/mL (0 °C; liquid) ^a 1.614 g/mL (10 °C; liquid) ^a	2.468 g/mL (solid) ^d
Odor	Pungent, distinctive from chlorine ^a	No data
Odor threshold:		
Water	No data	No data
Air	No data	No data
Taste	No data	No data
Solubility:		
Water	3.01 g/L at 25 °C and 34.5 mm Hg ^c	390 g/L at 30 °C ^c
Other solvents	No data	No data
Partition coefficients:		
Log K _{ow}	No data	No data
Log K _{oc}	No data	No data
Vapor pressure at 25 °C	>1 atm (gas) ^e	No data
Photolysis	Unstable in light ^e	No data
Henry's law constant at 25 °C	No data	No data
Autoignition temperature	No data	No data
Flashpoint	No data	No data
Flammability limits at 25 °C	No data	No data
Incompatibilities	Organic materials, heat, phosphorus, potassium hydroxide, sulfur, mercury, carbon monoxide; unstable in light; a powerful oxidizer ^e	Organic matter, sulfur, powdered coal; a powerful oxidizer ^b
Conversion factors (25 °C and 1 atm)	1 ppm=2.76 mg/m ^{3e}	No data

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Property	Chlorine dioxide	Sodium chlorite
Explosive limits	Explosive at temperatures $>-40\text{ }^{\circ}\text{C}^{\text{a}}$ and concentrations in excess of 10% v/v at 1 atm ^f	No data

^aKaczur and Cawfield 1993

^bVogt et al. 1986

^cO'Neil 2001

^dHSDB 2002

^eNIOSH 2002

^fDobson and Cary 2002