

## GHS Classification

**ID201**

**Manganese dioxide**

**CAS 1313-13-9**

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	—	—	—	Containing no chemical groups with explosive properties
2 Flammable gases	Not applicable	—	—	—	Classified as "solid" according to GHS definition
3 Flammable aerosols	Not applicable	—	—	—	Not aerosol products
4 Oxidizing gases	Not applicable	—	—	—	Classified as "solid" according to GHS definition
5 Gases under pressure	Not applicable	—	—	—	Classified as "solid" according to GHS definition
6 Flammable liquids	Not applicable	—	—	—	Classified as "solid" according to GHS definition
7 Flammable solids	Not classified	—	—	—	Non-flammable (ICSC, 2003)
8 Self-reactive substances and mixtures	Not applicable	—	—	—	Containing no chemical groups with explosive or self-reactive properties
9 Pyrophoric liquids	Not applicable	—	—	—	Classified as "solid" according to GHS definition
10 Pyrophoric solids	Not classified	—	—	—	Non-combustible (ICSC, 2003)
11 Self-heating substances and mixtures	Not classified	—	—	—	Non-combustible (ICSC, 2003)
12 Substances and mixtures, which in contact with water, emit flammable gases	Not classified	—	—	—	Stable to water (insoluble, ICSC (2003))
13 Oxidizing liquids	Not applicable	—	—	—	Classified as "solid" according to GHS definition
14 Oxidizing solids	Classification not possible	—	—	—	Classification not possible due to lack of data, though being inorganic compounds containing oxygen which "intensifies combustion of other materials" according to ICSC (2003).
15 Organic peroxides	Not applicable	—	—	—	Not organic compounds
16 Corrosive to metals	Classification not possible	—	—	—	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	—	—	—	Based on the LD50 (oral route) value of 11,710mg/kg (CERI Hazard Data 2001-60 (2002).
1 Acute toxicity (dermal)	Classification not possible	—	—	—	No data available
1 Acute toxicity (inhalation: gas)	Not applicable	—	—	—	Due to the fact that the substance is "solid" according to the GHS definition and inhalation of its gas is not expected.
1 Acute toxicity (inhalation: dust, mist)	Classification not possible	—	—	—	No data available
2 Skin corrosion / irritation	Classification not possible	—	—	—	IUCLID (2000) reports epidemiological evidence of human exposure: "slightly irritating." However, classification is not possible since details are not available.
3 Serious eye damage / eye irritation	Classification not possible	—	—	—	IUCLID (2000) reports epidemiological evidence of human exposure: "irritating." However, classification is not possible since details are not available.
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: CACAD 12 (1999) reports human epidemiological evidence suggesting skin sensitization. However, CACAD does not make conclusions about the presence of sensitization.
5 Germ cell mutagenicity	Classification not possible	—	—	—	No data available
6 Carcinogenicity	Classification not possible	—	—	—	Classification not possible based on expert judgment in the absence of existing classification.
7 Toxic to reproduction	Classification not possible	—	—	—	No data available
8 Specific target organs/systemic toxicity following single exposure	Category 1 (respiratory organs)	Health hazard	Danger	Causes damage to organs (respiratory organs)	"Acute exposure to manganese dust (in particular, MnO2 and M3nO4) induces pulmonary inflammation which progresses to pulmonary impairment with time. Pulmonary effects increase the infectiousness of bronchitis etc., resulting in manganese pneumonia" (CICAD 12 (1999)).
9 Specific target organs/systemic toxicity following repeated exposure	Category 1 (respiratory organs, nervous system, cardiovascular system)	Health hazard	Danger	Causes damage to organs through prolonged or repeated exposure (respiratory organs, nervous system, cardiovascular system)	Based on the human evidence including "increased incidence of cases diagnosed as pneumonia," "the patient exhibited facial masking, reduced blinking reflex, micrographia, loss of associated arm movements, tremor of the right hand and some cogwheel rigidity of the right extremities," "psychopathological/neurological collapse" (EHC 17 (1981)), "impaired eye-hand coordination/visual reaction" (CICAD 12 (1999)), "a greater incidence of low diastolic blood pressure," "impaired visual reaction time, hand-eye coordination, and hand steadiness" (ATSDR (2000)), and the evidence from animal studies including "sudden movement and torpor, nervousness, severe tremor, flexion-extension movements of upper limbs, yawning, and cyanosis; atrophy of the cerebellar cortex," "peribronchial and perivascular sclerosis and inflammatory changes" (EHC 17 (1981)). The effects on experimental animals were observed at dosing levels within the guidance value ranges for Category 1.
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)	Classification not possible	-	-	-	No data available
11 Hazardous to the aquatic environment (chronic)	Classification not possible	-	-	-	No data available