

## GHS Classification

**ID289**

**Selenium dioxide**

**CAS 7446-08-4**

Date Classified: Jun. 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              | —      | —           | —                | 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, 2004)  |
| 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, 2004)  |
| 11 Self-heating substances and mixtures                                       | Not classified              | —      | —           | —                | Non-combustible (ICSC, 2004)  |
| 12 Substances and mixtures, which in contact with water, emit flammable gases | Not classified              | —      | —           | —                | Stable to water (water solubility: 40g/100mL (20degC), ICSC(2004))  |
| 13 Oxidizing liquids  | Not applicable              | —      | —           | —                | Classified as "solid" according to GHS definition   |
| 14 Oxidizing solids   | Classification not possible | —      | —           | —                | Classification not possible due to the absence of data, though being inorganic compounds containing oxygen. |
| 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)  | Category 2  | Skull and crossbones                                    | Danger  | Fatal if swallowed   | Based on the rat LD50 (oral route) of 48mg/kg (ATSDR (2003)).   |
| 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   | —   | —   | —  | A case of human occupational exposure is reported in EHC 58 (1986): "skin irritation was observed among workers handling selenium dioxide." However, this effect might potentially be attributable to selenious acid which is generated when selenium dioxide comes in contact with water or perspiration. Given this, it was decided not to use this specific observation for classification.  |
| 3 Serious eye damage / eye irritation                                | Category 2A-2B  | Exclamation mark  | Warning   | Causes serious eye irritation  | Based on the reports of occupational exposure (PATTY (4th, 2000) and EHC 58 (1986)): "Selenium dioxide produced irritation of the eye, but the effects were reversible." The substance should be placed in Category 2A from the viewpoint of safety, if further subclassification is needed.  |
| 4 Respiratory/skin sensitization                                     | Respiratory sensitization: Classification not possible<br>Skin sensitization: Classification not possible | (Respiratory sensitization) –<br>(Skin sensitization) – | (Respiratory sensitization) –<br>(Skin sensitization) – | (Respiratory sensitization) –<br>(Skin sensitization) –  | Respiratory sensitization: No data available<br>Skin sensitization: No data available   |
| 5 Germ cell mutagenicity   | Classification not possible   | —   | —   | —  | Based on the absence of data on in vivo mutagenicity/genotoxicity tests and no positive data on mutagenicity tests in vitro (several indices), described in ATSDR (2003) and EHC 58 (1986).   |
| 6 Carcinogenicity  | Not classified  | —   | —   | —  | Due to the fact that the substance is classified as Category D by EPA (1993) and Group 3 by IARC (1987).  |
| 7 Toxic to reproduction  | Classification not possible   | —   | —   | —  | Insufficient data available   |
| 8 Specific target organs/systemic toxicity following single exposure | Category 1 (heart, central nervous system, blood system)<br>Category 2 (respiratory organs)               | Health hazard   | Danger<br>Warning                                       | Causes damage to organs (heart, central nervous system, blood system)<br>May cause damage to organs (respiratory organs) | Based on the human evidence including "diffuse swelling of the heart and cerebral edema; most notable findings were orange-brown discoloration of skin and whole internal organs, which appears to be attributable to hemolysis" (PATTY (4th, 2000)) and "pulmonary edema" (HSDB (1998)), and the evidence from animal studies including "decreases in activity/muscle tension/contact response/breathing, low body temperature" (ATSDR (2004)). The effects on experimental animals were observed at dosing levels within the guidance value ranges for Category 1 (nervous system). |

|    |  |  |               |                   |   |   |
|----|--|--|---------------|-------------------|---|---|
| 9  | Specific target organs/systemic toxicity following repeated exposure | Category 1 (respiratory organs, liver)<br>Category 2 (kidneys) | Health hazard | Danger<br>Warning | Causes damage to organs through prolonged or repeated exposure (respiratory organs, liver)<br>May cause damage to organs through prolonged or repeated exposure | Based on the human evidence including "moderate pulmonary emphysema and hepatic function disorder" (EHC 58 (1986)), and the evidence from animal studies including "acute renal failure and acute renal tubular necrosis" (RTECS (2004)). |
| 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 1     | Environment | Warning     | Very toxic to aquatic life                           | It was classified into Category 1 from 72 hours EC50=100microg/L of the algae (Scenedesmus) (AQUIRE, 2003).  |
| 11 Hazardous to the aquatic environment (chronic) | Category 1     | Environment | Warning     | Very toxic to aquatic life with long lasting effects | Since acute toxicity was Category 1 and it was a metallic compound, and since an underwater action and bio-accumulation were unknown, it was classified into Category 1. |