

GHS Classification

ID62

CAS 7782-41-4

Physical Hazards

Fluorine

Date Classified: Jun. 20, 2006 (Environmental Hazards: Mar. 31, 2006)

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	Not classified	—	—	—	Non-combustible (ICSC, 2004)
3 Flammable aerosols	Not applicable	—	—	—	Not aerosol products
4 Oxidizing gases	Category 1 (compressed). Classification not possible (not compressed)	Flame over circle	Danger	May cause or intensify fire; oxidizer	Classified as a powerful oxidant (ICSC (2004)). Those compressed are classified into Division 5.1 (UN#1045 (compressed gas)) by the UN Recommendations on the Transport of Dangerous Goods. Those other than compressed cannot be classified due to lack of data.
5 Gases under pressure	Compressed gas	gas cylinder	Warning	Contains gas under pressure; may explode if heated	The boiling point is -188degC (ICSC (2004)) and the critical temperature is -129degC (Merck (13th, 2001)), corresponding to "compressed gases" Those compressed are classified into Division 2.3 (UN#1045) (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	—	—	—	No data available
1 Acute toxicity (dermal)	Classification not possible	—	—	—	No data available
1 Acute toxicity (inhalation: gas)	Category 1	Skull and crossbones	Danger	Fatal if inhaled	Based on the LC50 (4 hours) of 92.5ppm calculated from the testing data of rat LC50 (1-hour inhalation of gas) of 185ppm (PATTY (4th, 2000)).
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 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	—	—	—	No data available
3 Serious eye damage / eye irritation	Category 2A-2B	Exclamation mark	Warning	Causes serious eye irritation	Based on the description in the report on the human effects (PATTY vol.6): "The substance produced irritation of the eye." Although classified into Category 2A-2B given the severity of effects is unknown, it 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 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	Classification not possible	—	—	—	No data available As for the health hazards, refer to "ID479, sodium fluoride, CAS: 7681-49-4."
6 Carcinogenicity	Classification not possible	—	—	—	Classification not possible based on expert judgment, given the absence of existing classification. As for the health hazards, refer to "ID479, sodium fluoride, CAS: 7681-49-4."
7 Toxic to reproduction	Category 2	Health hazard	Warning	Suspected of damaging fertility or the unborn child	Based on the evidence of adverse effects on the testes, described in ATSDR (2003), though no data are available on maternal toxicity. As for the health hazards, refer to "ID479, sodium fluoride, CAS: 7681-49-4."
8 Specific target organs/systemic toxicity following single exposure	Category 1 (respiratory organs, liver, kidneys)	Health hazard	Danger	Causes damage to organs (respiratory organs, liver, kidneys)	Based on the human evidence including "pulmonary inflammation, coughing, chest tightness, chill, fever, rale, cyanosis and pulmonary edema" (EHC 36 (1984)), "respiratory pain, headache, nausea, polyuria and polydipsia" (HSDB (1998)), and the evidence from animal studies including "hepatocytonecrosis, renal tubular necrosis (in rodents), pulmonary congestion, dyspnea, irritation, alveolar necrosis" (ATSDR (2003)). The effects on experimental animals were observed at dosing levels within the guidance value ranges for Category 1.

9	Specific target organs/systemic toxicity following repeated exposure	Category 1 (respiratory organs, testes)	Health hazard	Danger	Causes damage to organs through prolonged or repeated exposure (respiratory organs, testes)	Based on the evidence from animal studies including "hemorrhage of the lung, pulmonary edema, bronchial inflammation, adverse effects on the respiratory organs (severe irritation of the lung) and degeneration of the testes" (ATSDR (2003)). The effects on experimental animals were observed at dosing levels within the guidance value ranges for Category 1.
10	Aspiration hazard	Not applicable	—	—	—	Due to the fact that the substance is a gas at ordinary temperatures.

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