

GHS Classification

ID327

Thallium nitrate

CAS 10102-45-1

Date Classified: Sep. 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 classified	—	—	—	No data available though being nitrates, containing chemical groups with explosive properties. Classified into Divisions 5.1 and 6.1 (UN#2727) (UN Recommendations on the Transport of Dangerous Goods).
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	—	—	—	Classified into Divisions 5.1 and 6.1 (UN#2727) (UN Recommendations on the Transport of Dangerous Goods).
8 Self-reactive substances and mixtures	Not applicable	—	—	—	Classified as oxidizing solids, though being nitrates containing chemical groups with explosive properties. Classified into Divisions 5.1 and 6.1 (UN#2727) (UN Recommendations on the Transport of Dangerous Goods).
9 Pyrophoric liquids	Not applicable	—	—	—	Classified as "solid" according to GHS definition
10 Pyrophoric solids	Not classified	—	—	—	Classified into Divisions 5.1 and 6.1 (UN#2727) (UN Recommendations on the Transport of Dangerous Goods).
11 Self-heating substances and mixtures	Classification not possible	—	—	—	No data available
12 Substances and mixtures, which in contact with water, emit flammable gases	Not classified	—	—	—	Stable to water (water solubility: 9.55g/100g (20degC), Lide (84th, 2003))
13 Oxidizing liquids	Not applicable	—	—	—	Classified as "solid" according to GHS definition
14 Oxidizing solids	Category 2	Flame over circle	Danger	May intensify fire; oxidizer	Inorganic compounds containing oxygen and classified as a powerful oxidant according to HSDB (2006). Classified as "Division 5.1: oxidizing substances" by the UN Recommendations on the Transport of Dangerous Goods. However, it can be included in Category 2 or 3, given the fact that it has subsidiary risks corresponding to Division 6.1 and is assigned to Packing Group II (UN#2727). The substance is placed in Category 2 from the
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 mouse LD50 (oral route) value of 15mg/kg (RTECS (2004)).
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	Category 1A-1C	Corrosion	Danger	Causes severe skin burns and eye damage	Based on the description in the report on epidemiological studies of human exposure (HSDB (2006)): "The substance severely burns the skin and eye." The substance is thus considered to have corrosive effects. Although classified into Category 1A-1C, it should be placed in Category 1A from the viewpoint of safety if further subclassification is needed.
3 Serious eye damage / eye irritation	Category 1	Corrosion	Danger	Causes serious eye damage	Based on the description in the report on epidemiological studies of human exposure (HSDB (2006)): "The substance severely burns the skin and eye." The substance is thus considered to have corrosive effects on the eye.
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
6 Carcinogenicity	Not classified	—	—	—	Due to the fact that the substance is classified as Category D by EPA (1990).
7 Toxic to reproduction	Classification not possible	—	—	—	No data available
8 Specific target organs/systemic toxicity following single exposure	Category 1 (nervous system, respiratory organs, cardiovascular system), Category 2 (kidneys, liver)	Health hazard	Danger	Causes damage to organs (nervous system, respiratory organs, cardiovascular system) May cause damage to organs (kidneys, liver)	Based on the human evidence: "Lungs showed diffuse alveolar damage. There was extensive damage of the myocardium. Cranial and peripheral neuropathy was observed" (ATSDR (1992)), "temporary lesion of the kidneys and liver, and temporary toxic neuropathy of ocular nerve with subsequent polyneuropathy" (HSDB (2005)). The effects on the kidneys and liver are classified into Category 2 since the priority rating of the referenced study is 2.

9	Specific target organs/systemic toxicity following repeated exposure	Category 1 (nervous system, skin, testes) Category 2 (cardiovascular system)	Health hazard	Danger	Causes damage to organs through prolonged or repeated exposure (nervous system, skin, testes) May cause damage to organs through prolonged or repeated exposure (cardiovascular)	Based on the human evidence: "Thallium may affect the nervous system following inhalation" (ATSDR 1992), "chief complaints included abdominal pain, fatigue, irritancy, body weight reduction and pain in legs. Four patients had loss of hair" (ACGIH 2001), "clinical symptoms began with excitement and sleeplessness" (PATTY (5th 2001)), "paraesthesia and polyneuritis such as pain in muscles and joints, as well as psychasthenic symptoms such as headache, sleep disorders and fatigue" (EHC 182 (1996)), "may affect the cardiovascular/nervous systems" (IPCS (J) (2002)). Also based on the evidence from animal studies: "thallium caused disturbed behaviour, aggressiveness, diarrhoea, and loss of hair." "Testicular effects including disarrangement of the tubular epithelium, cytoplasmic vacuolization, and distention of the smooth endoplasmic reticulum of Sertoli cells" (EHC 182 (1996)). The effects on the cardiovascular system are classified into Category 2 since the priority rating of the referenced study is 2.
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 2	—	—	Toxic to aquatic life	It was classified into Category 2 from 24 hours LC50=1142microg/L of the crustacea (Daphnia magna) (AQUIRE, 2003).
11 Hazardous to the aquatic environment (chronic)	Category 2	Environment	—	Toxic to aquatic life with long lasting effects	Since acute toxicity was Category 2 and it was a metallic compound and an underwater action and bio-accumulation were unknown, it was classified into Category 2.