

GHS Classification

ID643

Warfarin

CAS 81-81-2

Date Classified: Feb. 20, 2007 (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	Classification not possible	-	-	-	Classification not possible due to lack of data, though the substance contains unsaturated C=C bonds as chemical groups associated with explosive properties present.
2 Flammable gases	Not applicable	-	-	-	Solid (GHS definition)
3 Flammable aerosols	Not applicable	-	-	-	Not aerosol products
4 Oxidizing gases	Not applicable	-	-	-	Solid (GHS definition)
5 Gases under pressure	Not applicable	-	-	-	Solid (GHS definition)
6 Flammable liquids	Not applicable	-	-	-	Solid (GHS definition)
7 Flammable solids	Classification not possible	-	-	-	No data available
8 Self-reactive substances and mixtures	Classification not possible	-	-	-	Classification not possible due to lack of data, though the substance contains unsaturated C=C bonds as chemical groups with self-reactive properties present.
9 Pyrophoric liquids	Not applicable	-	-	-	Solid (GHS definition)
10 Pyrophoric solids	Classification not possible	-	-	-	No data available
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 applicable	-	-	-	The chemical structure of the substance does not contain metals or metalloids(B, Si, P, Ge, As, Se, Sn, Sb, Te, Bi, Po, At).
13 Oxidizing liquids	Not applicable	-	-	-	Solid (GHS definition)
14 Oxidizing solids	Not applicable	-	-	-	Organic compounds containing oxygen (but not chlorine and fluorine) and the oxygen is chemically bonded only to carbon and hydrogen (but not to other elements).
15 Organic peroxides	Not applicable	-	-	-	Organic compounds containing no -O-O- structure
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	It was set as Category 2 based on LD50=25.7 mg/kg calculated from nine data of rats (EHC 175 (1995), ACGIH (2001), PIMs (1997)). In addition, this product has high influenced factors and LD50 value has also quite large range.
1 Acute toxicity (dermal)	Category 4	Exclamation mark	Warning	Harmful in contact with skin	It was set as Category 4 based on rat LD50 = 1400mg/kg (ACGIH (2001)).
1 Acute toxicity (inhalation: gas)	Not applicable	-	-	-	Solid (GHS definition)
1 Acute toxicity (inhalation: vapour)	Category 1	Skull and crossbones	Danger	Fatal if inhaled	Since the saturated vapor pressure concentration of this product is 89.8ppm, it is thought that the inhalation test was done with vapor. It was classified as Category 1 based on LC50 = 25.38ppm (ACGIH (2001)) obtained in rat inhalation
1 Acute toxicity (inhalation: dust, mist)	Classification not possible	-	-	-	No data available
2 Skin corrosion / irritation	Classification not possible	-	-	-	There are statements of producing severe dermatitis, producing a necrosis on the skin, etc. (ACGIH (2001), HSDB (2005)). But it is unknown whether it is the result of contacting the skin, and data is insufficient, it cannot be classified.
3 Serious eye damage / eye irritation	Classification not possible	-	-	-	No data 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. Skin sensitization: Although there is a statement nothing the skin hypersensitivity by WARUFARIN(HSDB (2005)), it is unknown whether it was caused by the cutaneous contact. Since data is insufficient, it cannot be classified.
5 Germ cell mutagenicity	Classification not possible	-	-	-	No data available
6 Carcinogenicity	Classification not possible	-	-	-	No data available
7 Toxic to reproduction	Category 1A	Health hazard	Danger	May damage fertility or the unborn child	It is classified into Category 1A based on many statements of disordering on child growth and generatind in humans (EHC 175 (1995), ACGIH (2001), PIMs (1997), HSDB (2005)). In addition, there is a classification of Repr.Cat.1;R61 by EU.

8	Specific target organs/systemic toxicity following single exposure	Category 1 (blood system)	Health hazard	Danger	Cause damage to organs (blood system)	Although any symptom hardly appears immediately with a single injection or intake according to in-human trials or case reports, it is obvious that it has an effect on blood clotting, judging from the statement that decrease of prothrombin concentration in blood and extension of prothrombin time were observed (EHC 175 (1995), PDs (2006), PIMs (1997), HSDB (2005)). Moreover, there is a description that the acute effect which appears after a single injection or injection for several days results from the bleeding and increase of bleeding tendency caused by the prothrombin inhibition. While there are reports on many bleeding cases (EHC 175 (1995), PIMs (1997), HSDB (2005)), and a statement that the target is the blood system (PIMs (1997)). It was set as Category 1 (blood systems) based on the above information.
9	Specific target organs/systemic toxicity following repeated exposure	Category 1 (blood system, bone, skin); Category 2 (liver, kidneys)	Health hazard	Danger	Causes damage to organs (blood system, bone, skin) through prolonged or repeated exposure; May cause damage to organs (liver, kidneys) through prolonged or repeated exposure	In WARFARIN repeated exposure to humans, the coagulation defects by decreasing in prothrombin causes bleeding in different organs and also many symptoms accompanying it are seen. As a bleeding part, many organs and tissues, such as mucous membrane of gingiva and nose, gastroenteric tract, liver, brain, spinal epidural, urinary system and subcutaneous are described (EHC 175 (1995), ACGIH (2001), PDs (2006), PIMs (1997)). It was classified to as Category 1 (blood systems) based on these informations. Based on the statement that since the little decrease of vitamin K concentration caused osteoporosis in humans, long-term treatment of low dose with anticoagulants may have a negative impacts on bone metabolism (EHC 175(1995)), it was classified to Category 1 (bone). Also in an animal, although it cannot be compared with a guidance value because of unknown dose or dosed through hypodermic injection, there is a statement of the bone loss (EHC 175 (1995)) and bone weakening by the cancellous bones loss (HSDB (2005)) etc. Moreover, it was classified to as Category 1 (skin) based on the statement that the skin necrosis ("WARFARIN induced skin necrosis") is known as one of the side effects of WARFARIN in humans (EHC 175 (1995), PDs (2006)) . Based on the statement of possibility of affection to liver and kidney (HSFS(2005)), it was classified to as Category 2 (liver, kidney) .
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	-	-	-	Insufficient data available.
11 Hazardous to the aquatic environment (chronic)	Classification not possible	-	-	-	Classification not possible due to lack of data