

Warfarin -MATERIAL SAFETY DATA SHEET

Manufacturer/information service:

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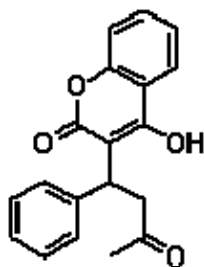
1. Chemical Product Identification

Product Name: Warfarin

Molecular Formula: C₁₉H₁₆O₄

Molecular Weight: 308.33

Structural Formula:



Chemical Name: (RS)-4-hydroxy-3-(3-oxo-1-phenylbutyl)-2H-chromen-2-one

Form: Crystalline powder

Color: Colourless to white

Odor: Odorless

CAS No.: 81-81-2

2. Composition / Information on Ingredients

Composition	CAS No.	Content %
Warfarin	81-81-2	97%
Other ingredients		3%

3. Hazards Identification

Potential Acute Health Effects:

Very hazardous in case of skin contact (permeator), of ingestion, of inhalation. Slightly hazardous in case of skin contact (irritant), of eye contact (irritant). Severe over-exposure can result in death.

Potential Chronic Health Effects:

Carcinogenic effects: Not available.

Mutagenic effects: Not available.

Teratogenic effects: Classified POSSIBLE for human.

Developmental toxicity: Classified Reproductive system/ toxin/ female [POSSIBLE].

The substance may be toxic to kidneys, liver.

Repeated or prolonged exposure to the substance can produce target organs damage. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

4. First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention if irritation occurs.

Skin Contact: In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation: Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Serious Ingestion: Not available.

5. Fire-Fighting Measures

Flash Point: 188°C

Fire Fighting: (Non-Specific -- Poison B Solid) Wear full protective clothing and self-contained breathing apparatus. (Non-Specific -- Poison B Solid) Extinguish fire using

agent suitable for type of surrounding fire. Use alcohol foam, carbon dioxide, or dry chemical.

Fire Potential: Contact with strong oxidizers may cause fires and explosions.

6. Accidental Release Measures

Small Spill: Use appropriate tools to put the spilled solid in a convenient waste disposal container.

Large Spill: Poisonous solid. Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

7. Handling And Storage

Storage: Store at away from heat and open flame. Do not store near feeds and foodstuffs and keep away from children, domestic animals, pets, or wildlife.

Handling: All chemicals should be considered hazardous. Avoid direct physical contact. Use appropriate, approved safety equipment. Untrained individuals should not handle this chemical or its container. Handling should occur in a chemical fume hood.

8. Exposure Controls/Personal Protection

Personal Protection: Wear appropriate protective gloves, clothing and goggles.

Respirators: Wear positive pressure self-contained breathing apparatus (SCBA).

Exposure Effects: Intracranial hemorrhage and hematomyelia may occur following warfarin therapy. The use of warfarin during pregnancy has been associated with teratogenic effects.
Fetal intraventricular hemorrhage has been reported following maternal ingestion of warfarin.
Craniofacial, musculoskeletal, skin, eye, gastrointestinal, and cardiovascular developmental abnormalities have been observed in the offspring of women administered warfarin sodium during pregnancy.
Intrauterine fetal demise, intrauterine growth retardation, and hemorrhagic disease of the newborn have been reported following administration of warfarin sodium to pregnant women.

Exposure Limits:

TWA: 0.1 (mg/m³) from OSHA (PEL) [United States]

TWA: 0.1 (mg/m³) from ACGIH (TLV) [United States]

TWA: 0.1 (mg/m³) from NIOSH [United States]

TWA: 0.1 STEL: 0.3 (mg/m³) [Canada]³

Consult local authorities for acceptable exposure limits.

Poison Class: 2

9. Physical and Chemical Properties

Appearance: Colourless to white crystalline powder

Melting Point: 167 - 168°C

Boiling Point: 515°C

Vapor Pressure: 3.0mPa at 25°C.

Partition Coefficient: 2.52

Heat Of Vaporization: 82.9 kJ/mol

Bulk density /Specific gravity: 1.35 g/ml

Solubility: Soluble in acetone. Partially soluble in cold water, methanol. Very slightly soluble in diethyl ether. Moderately solubility in ethanol, isopropanol, some oils. Freely soluble in alkaline aqueous solutions. Practically insoluble in cyclohexane, skellysolves.

Solubility in water: 1.7 mg/100 ml water at 20°C.

Solubility in benzene: 0.3%.

Solubility in acetone: 6.5 g/100 ml at 20°C.

Solubility in Chloroform: 5.6 g/100 ml at 20°C.

Solubility in dioxane: 10 g/100 ml at 20°C.

Solubility up to 40% in water.

10. Stability and Reactivity

Stability: Contact with strong oxidizers may cause fires and explosions.

Incompatibilities: Incompatible with the following: Strong oxidizers.

Combustion Products: Fire may produce irritating, corrosive and/or toxic gases.

11. Toxicological Information

Routes of Entry: Absorbed through skin. Dermal contact. Inhalation. Ingestion.

Toxicity to Animals:

Acute oral toxicity (LD50): 1.6 mg/kg [Rat].

Acute dermal toxicity (LD50): 1400 mg/kg [Rat].

Chronic Effects on Humans:

Teratogenic effects: Classified POSSIBLE for human.

Developmental toxicity: Classified Reproductive system/ toxin/ female [possible].

May cause damage to the following organs: kidneys, liver.

Other Toxic Effects on Humans: Very hazardous in case of skin contact (permeator), of ingestion, of inhalation. Slightly hazardous in case of skin contact (irritant).

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: May cause adverse reproductive effects and birth defects (teratogenic)

Special Remarks on other Toxic Effects on Humans:

Acute Potential Health Effects:

Skin: May cause skin irritation. It can be absorbed through intact skin. Toxic if absorbed through the skin.

Eyes: May cause eye irritation.

Inhalation: Harmful if inhaled.

Ingestion: Toxic if swallowed. May be fatal if swallowed. May cause ulceration or bleeding from the small intestine. May affect the blood (hemorrhage, change in clotting factors, normocytic anemia, changes in red blood cell count), vascular system, behavior/central nervous system/ nervous system (somnolence, muscle weakness), respiration (dyspnea), urinary system (hematuria).

General symptoms of poisoning which begin after a few days or weeks of repeated exposure (ingestion), include epistaxis (nosebleed), bleeding gums, pallor, petechial rash, and hematomas around the joints, or on the buttocks, blood in the urine and feces. Bleeding may be initiated by normal movement of muscles and organs, or may occur spontaneously in organs which do not have substantial movement. Other symptoms back pain, bleeding lips, mucous membrane hemorrhage, abdominal pain, vomiting, paralysis due to cerebral hemorrhage, and finally hemorrhagic shock and death may occur.

Chronic Potential Health Effects: Not available

12. Ecological And Ecotoxicological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation: Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

13. Disposal Considerations

Do not reuse product containers. Dispose of product containers, waste containers, and residues according to local environmental regulations.

14. Transport Information

UN No.: 2811

Class: 6.1

Packaging Group: I, II, III

15. Regulatory Information

Not applicable.

16. Other Information

All information and instructions provided in this Material Safety Data Sheet (MSDS) are based on the current state of scientific and technical knowledge at the date indicated on the present MSDS and are presented in good faith and believed to be correct. This information applies to the product as such. In case of new formulations or mixes, it is necessary to ascertain that a new danger will not appear. It is the responsibility of persons on receipt of this MSDS to ensure that the information contained herein is properly read and understood by all people who may use, handle, dispose or in any way come in contact with the product. If the recipient subsequently produce formulations containing this product, it is the recipients sole responsibility to ensure the transfer of all relevant information from this MSDS to their own MSDS.