Material Safety Data Sheet

**WARFARIN**

Version 2.1

Revision Date 12/16/2010 Ref. 130000000646

This SDS adheres to the standards and regulatory requirements of the United States and may not meet the regulatory requirements in other countries.

### SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

- **Product name**: WARFARIN
- **MSDS Number**: 130000000646
- **Product Use**: Transported isolated intermediate used under strictly controlled conditions
- **Manufacturer**: DuPont
  1007 Market Street
  Wilmington, DE 19898
- **Product Information**: 1-800-441-7515 (outside the U.S. 1-302-774-1000)
- **Medical Emergency**: 1-800-441-3637 (outside the U.S. 1-302-774-1139)
- **Transport Emergency**: CHEMTREC: 1-800-424-9300 (outside the U.S. 1-703-527-3887)

### SECTION 2. HAZARDS IDENTIFICATION

**Emergency Overview**
It inhibits prothrombin formation which results in decreased blood clotting capacity.

**Warning symptoms:**
Abdominal pain Gum bleeding, Nose bleeding, Bruising and haemorrhage formation

**Potential Health Effects**

**Ingestion Warfarin**
Effects due to ingestion may include: Internal bleeding, The product inhibits prothrombin formation which results in decreased blood clotting capacity.

**Repeated exposure Warfarin**
May cause harm to the unborn child. Adverse effects from repeated exposure may include:
Abnormal blood clotting with easy bruising or bleeding
Internal abdominal bleeding which could produce abdominal pain, bloating, low blood pressure, dizziness, light-headedness, fainting, sweating, shortness of breath, vomiting blood, blood in stools

**Target Organs**
**WARFARIN**

**Version 2.1**

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<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Concentration</th>
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<tbody>
<tr>
<td>Warfarin</td>
<td>81-81-2</td>
<td>100 %</td>
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**Carcinogenicity**

None of the components present in this material at concentrations equal to or greater than 0.1% are listed by IARC, NTP, or OSHA, as a carcinogen.

**SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS**

**SECTION 4. FIRST AID MEASURES**

- **Skin contact**: Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Wash contaminated clothing before re-use. Discard contaminated shoes.

- **Eye contact**: Remove contact lenses. Rinse immediately with plenty of water, also under the eyelids. Call a poison control center or doctor for treatment advice.

- **Inhalation**: Move to fresh air. Oxygen or artificial respiration if needed. Call a physician immediately.

- **Ingestion**: Rinse mouth. Induce vomiting if person is conscious. Immediately give large quantities of water to drink. Never give anything by mouth to an unconscious person. Obtain medical attention.

- **General advice**: Remove from exposure, lie down. When symptoms persist or in all cases of doubt seek medical advice.

- **Notes to physician**: Vitamin K1 is a specific antidote.
SECTION 5. FIRE-FIGHTING MEASURES

Flammable Properties
Flash point : does not flash

Fire and Explosion Hazard : Hazardous decomposition products Carbon dioxide (CO2) Carbon monoxide

Suitable extinguishing media : Water spray, Dry powder, Foam, Carbon dioxide (CO2)

Firefighting Instructions : Wear self-contained breathing apparatus and protective suit. Evacuate personnel to safe areas. Do not allow run-off from fire fighting to enter drains or water courses.

SECTION 6. ACCIDENTAL RELEASE MEASURES

NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

Safeguards (Personnel) : Evacuate personnel to safe areas. Ensure adequate ventilation. Wear suitable protective equipment.

Spill Cleanup : Shovel into suitable container for disposal. Avoid dust formation. Clean contaminated surface thoroughly.

Accidental Release Measures : Do not flush into surface water or sanitary sewer system. Dispose of in accordance with local regulations.

SECTION 7. HANDLING AND STORAGE

Handling (Personnel) : Avoid contact with skin, eyes and clothing. Do not breathe dust. Provide appropriate exhaust ventilation at places where dust is formed. Wear self-contained breathing apparatus and protective suit. Avoid contact with skin, eyes and clothing. Do not breathe dust. Wash hands before breaks and immediately after handling the product. Discard contaminated shoes. Wash contaminated clothing before re-use. Routinely monitor blood clotting capacity of personnel handling this product.
Handling (Physical Aspects) : Keep away from open flames, hot surfaces and sources of ignition.

Storage : Keep containers tightly closed in a cool, well-ventilated place.
Keep away from oxidising agents and strongly acid or alkaline materials.

Storage temperature : 15 - 30 °C (59 - 86 °F)

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering controls : Ensure adequate ventilation.

Personal protective equipment
Respiratory protection : In the case of respirable dust, use self-contained breathing apparatus. Respirator with a particle filter (EN 143)
Hand protection : Material: Protective gloves
Eye protection : Safety goggles Face-shield
Skin and body protection : Complete suit protecting against chemicals
Complete head face and neck protection
Boots
Apron

Exposure Guidelines
Exposure Limit Values
WARFARIN
AEL * ( ) 0.002 mg/m³ 8 & 12 hr. TWA

Remarks
Can be absorbed through skin.

Warfarin
PEL: (OSHA) 0.1 mg/m³ 8 hr. TWA
TLV (ACGIH) 0.1 mg/m³ TWA
AEL * (DUPONT) 0.002 mg/m³ 8 & 12 hr. TWA, Skin
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* AEL is DuPont's Acceptable Exposure Limit. Where governmentally imposed occupational exposure limits which are lower than the AEL are in effect, such limits shall take precedence.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Form : solid, crystalline
Color : white
Odor : none
pH : 5.6 at > 0.2 g/l
Melting point/range : 159 - 164 °C (318 - 327 °F)
Vapour Pressure : 0.00003 hPa at 20 °C (68 °F)
Specific Gravity : 0.24 at 20 °C (68 °F)
Water solubility : 0.017 g/l at 25 °C (77 °F)
Partition coefficient: n-octanol/water : log Pow: 2.7

SECTION 10. STABILITY AND REACTIVITY

Conditions to avoid : Direct sources of heat. Exposure to light.
Incompatibility : Oxidizing agents Acids, alkalies
Hazardous decomposition products : Carbon monoxide, Carbon dioxide (CO2)
Hazardous reactions : None reasonably foreseeable.

SECTION 11. TOXICOLOGICAL INFORMATION

WARFARIN
Reproductive toxicity : Substances known to cause developmental toxicity in humans.
Further information : The product inhibits prothrombin formation which results in decreased blood clotting capacity. All symptoms are associated with haemorrhage either into body cavities or tissues.

Warfarin
Dermal LD50 : 40 mg/kg, rat
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Oral LD50 : 1.6 mg/kg , rat
Inhalation 4 h LC50 : 0.005 mg/l , rat
Skin irritation : rabbit
Eye irritation : rabbit
Skin sensitization : Did not cause sensitization on laboratory animals., guinea pig
Repeated dose toxicity :
Target Organs: Blood
Prolonged blood-clotting time, Abnormal formation of blood cells, bone marrow changes
Carcinogenicity : Overall weight of evidence indicates that the substance is not carcinogenic.
Mutagenicity : Did not cause genetic damage in animals. Genetic damage in cultured mammalian cells was observed in some laboratory tests but not in others. Did not cause genetic damage in cultured bacterial cells.
Teratogenicity : Animal testing showed effects on embryo-foetal development at levels below those causing maternal toxicity. Foetal malformations Reduced embryo-foetal viability

SECTION 12. ECOLOGICAL INFORMATION

Aquatic Toxicity
WARFARIN
Cell multiplication inhibition test NOEC : Scenedesmus capricornutum (fresh water algae) 0.073 mg/l
Growth inhibition NOEC : Scenedesmus capricornutum (fresh water algae) 0.34 mg/l
Warfarin
LC50 : Oncorhynchus mykiss (rainbow trout) 16 mg/l
96 h LC50 : Oncorhynchus mykiss (rainbow trout) 65 mg/l
WARFARIN

SECTION 13. DISPOSAL CONSIDERATIONS

Waste Disposal : Dispose of as special waste in compliance with local and national regulations.

Environmental Hazards : If recycling is not practicable, dispose of in compliance with local regulations.

SECTION 14. TRANSPORT INFORMATION

DOT        UN number : 3027

Proper shipping name : Coumarin derivative pesticides, solid, toxic
Class : 6.1
Packing group : I
Labelling No. : 6.1
Reportable Quantity : 100 lbs Warfarin

IATA_C     UN number : 3027

Proper shipping name : Coumarin derivative pesticide, solid, toxic (Warfarin)
Class : 6.1
Packing group : I
Labelling No. : 6.1

IMDG       UN number : 3027

Proper shipping name : Coumarin derivative pesticide, solid, toxic (Warfarin)
Class : 6.1
Packing group : I
Labelling No. : 6.1
SECTION 15. REGULATORY INFORMATION

TSCA Status : On the inventory, or in compliance with the inventory

SARA 313 Regulated Chemical(s) : Warfarin

CERCLA Reportable Quantity : 100 lbs
Based on the percentage composition of this chemical in the product.: Warfarin

SARA Reportable Quantity : 100 lbs
Based on the percentage composition of this chemical in the product.: Warfarin

California Prop. 65 : WARNING! This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. Warfarin

PA Right to Know Regulated Chemical(s) : Substances on the Pennsylvania Hazardous Substances List present at a concentration of 1% or more (0.01% for Special Hazardous Substances): Warfarin

NJ Right to Know Regulated Chemical(s) : Substances on the New Jersey Workplace Hazardous Substance List present at a concentration of 1% or more (0.1% for substances identified as carcinogens, mutagens or teratogens): Warfarin

SECTION 16. OTHER INFORMATION

Contact person : MSDS Coordinator, DuPont Chemicals and Fluoroproducts, Wilmington, DE 19898, (800) 441-7515

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