Doxorubicin hydrochloride: ORAL (LD50): Acute: 698 mg/kg [Mouse].
### Section 3. Hazards Identification

<table>
<thead>
<tr>
<th>Potential Acute Health Effects</th>
<th>Hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion. Slightly hazardous in case of inhalation.</th>
</tr>
</thead>
</table>
| Potential Chronic Health Effects | CARCINOGENIC EFFECTS: Classified (Anticipated carcinogen) by NTP.  
**MUTAGENIC EFFECTS:** Mutagenic for bacteria and/or yeast.  
**TERATOGENIC EFFECTS:** Not available.  
**DEVELOPMENTAL TOXICITY:** Not available.  
The substance may be toxic to heart, bone marrow.  
Repeated or prolonged exposure to the substance can produce target organs damage. |

### Section 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. |
| 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 | Not available. |
| Ingestion | Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband. |
| Serious Ingestion | Not available. |

### Section 5. Fire and Explosion Data

| Flammability of the Product | May be combustible at high temperature. |
| Auto-Ignition Temperature | Not available. |
| Flash Points | Not available. |
| Flammable Limits | Not available. |
| Products of Combustion | These products are carbon oxides (CO, CO2), nitrogen oxides (NO, NO2...), halogenated compounds. |
| Fire Hazards in Presence of Various Substances | Slightly flammable to flammable in presence of heat. |
| Explosion Hazards in Presence of Various Substances | Risks of explosion of the product in presence of mechanical impact: Not available.  
Risks of explosion of the product in presence of static discharge: Not available. |
| Fire Fighting Media and Instructions | SMALL FIRE: Use DRY chemical powder.  
LARGE FIRE: Use water spray, fog or foam. Do not use water jet. |
| Special Remarks on Fire Hazards | As with most organic solids, fire is possible at elevated temperatures |
| Special Remarks on Explosion Hazards | Not available. |
Section 6. Accidental Release Measures

**Small Spill**
Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

**Large Spill**
Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system.

Section 7. Handling and Storage

**Precautions**
Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe dust. Wear suitable protective clothing. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents.

**Storage**
Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8. Exposure Controls/Personal Protection

**Engineering Controls**
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

**Personal Protection**
Splash goggles. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent.

**Personal Protection in Case of a Large Spill**
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

**Exposure Limits**
Not available.

Section 9. Physical and Chemical Properties

<table>
<thead>
<tr>
<th>Physical state and appearance</th>
<th>Odor</th>
<th>Molecular Weight</th>
<th>Taste</th>
<th>pH (1% soln/water)</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solid. (Solid crystalline powder.)</td>
<td>Not available.</td>
<td>579.99 g/mole</td>
<td>Not available.</td>
<td>Not available.</td>
<td>Red-orange.</td>
</tr>
</tbody>
</table>

**Boiling Point**
Not available.

**Melting Point**
Decomposition temperature: 204.5°C (400.1°F)

**Critical Temperature**
Not available.

**Specific Gravity**
Not available.

**Vapor Pressure**
Not applicable.

**Vapor Density**
Not available.

**Vapility**
Not available.

**Odor Threshold**
Not available.

**Water/Oil Dist. Coeff.**
Not available.

**Ionicity (in Water)**
Not available.

**Dispersion Properties**
See solubility in water.

**Solubility**
Soluble in cold water.
Solubility in Water: 10 mg/ml
Section 10. Stability and Reactivity Data

| Stability | The product is stable. |
| Instability Temperature | Not available. |
| Conditions of Instability | Not available. |
| Incompatibility with various substances | Reactive with oxidizing agents. |
| Corrosivity | Non-corrosive in presence of glass. |
| Special Remarks on Reactivity | Not available. |
| Special Remarks on Corrosivity | Not available. |
| Polymerization | Will not occur. |

Section 11. Toxicological Information

| Routes of Entry | Inhalation. Ingestion. |
| Toxicity to Animals | Acute oral toxicity (LD50): 698 mg/kg [Mouse]. |
| Chronic Effects on Humans | CARCINOGENIC EFFECTS: Classified(Anticipated Carcinogen) by NTP. MUTAGENIC EFFECTS: Mutagenic for bacteria and/or yeast. May cause damage to the following organs: heart, bone marrow. |
| Other Toxic Effects on Humans | Hazardous in case of skin contact (irritant), of ingestion. Slightly hazardous in case of inhalation. |
| Special Remarks on Toxicity to Animals | Not available. |
| Special Remarks on Chronic Effects on Humans | May cause adverse reproductive effects. May affect genetic material (mutagenic). May cause cancer based on animal test data. |
| Special Remarks on other Toxic Effects on Humans | Acute Potential Health Effects: Skin: Causes skin irritation. Can cause blisters on contact with skin. Eyes: Causes eye irritation. Inhalation: May cause respiratory tract irritation. Ingestion: May cause nausea, vomiting, hypermotility, diarrhea, anorexia. May cause dermatitis. May affect behavior/central nervous system/peripheral nervous system/headache, tiredness, loss of strength and energy, muscle weakness), blood and bone marrow (changes in serum composition, normocytic anemia, changes in white blood cell count, leukopenia, reduction in the amount of blood platelets (thrombocytopenia)), cardiovascular system (arrhythmias, low blood pressure), urinary system (proteinuria, discolored (pink-colored) urine due to blood in urine, difficult urination). May cause anaphylaxis. May also cause increased sensitivity to sunlight. May also cause blistering, peeling, redness, and/or swelling of palms of hands or bottoms of feet, numbness, pain, fever sore throat, black tarry stools, pinpoint red spots on skin. Chronic Potential Health Effects: Ingestion: Repeated or prolonged ingestion may cause weight loss, may affect blood and bone marrow, liver, urinary system, cardiovascular system. Medical Conditions Aggravated by Exposure: Heart disease, liver function impairment; chickenpox (existing or recent exposure); prior radiation therapy. |
Section 12. Ecological 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 as toxic as the product itself.

Special Remarks on the Products of Biodegradation
Not available.

Section 13. Disposal Considerations

Waste Disposal
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14. Transport Information

DOT Classification
Not a DOT controlled material (United States).

Identification
Not applicable.

Special Provisions for Transport
Not applicable.

DOT (Pictograms)

Section 15. Other Regulatory Information and Pictograms

Federal and State Regulations
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Doxorubicin hydrochloride
California prop. 65: This product contains the following ingredients for which the State of California has found to cause reproductive harm (male) which would require a warning under the statute: Doxorubicin hydrochloride
California prop. 65: This product contains the following ingredients for which the State of California has found to cause birth defects which would require a warning under the statute: Doxorubicin hydrochloride
Pennsylvania RTK: Doxorubicin hydrochloride

California Proposition 65 Warnings
California prop. 65: This product contains the following ingredients for which the State of California has found to cause birth defects which would require a warning under the statute: Doxorubicin hydrochloride

Other Regulations
EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications
WHMIS (Canada) Not controlled (not available) under WHMIS (Canada).

DSCL (EEC) R22- Harmful if swallowed.
R36/38- Irritating to eyes and skin.
R45- May cause cancer.
S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S46- If swallowed, seek medical advice immediately and show this container or label.
S53- Avoid exposure - obtain special instructions before use.

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## Doxorubicin hydrochloride

<table>
<thead>
<tr>
<th>HMIS (U.S.A.)</th>
<th>National Fire Protection Association (U.S.A.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Hazard</td>
<td>2</td>
</tr>
<tr>
<td>Fire Hazard</td>
<td>1</td>
</tr>
<tr>
<td>Reactivity</td>
<td>0</td>
</tr>
<tr>
<td>Personal Protection</td>
<td>E</td>
</tr>
</tbody>
</table>

### Personal Protection
- **Gloves.**
- **Lab coat.**
- **Dust respirator.** Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. **Splash goggles.**

### WHMIS (Canada) (Pictograms)

### DSCL (Europe) (Pictograms)

### TDG (Canada) (Pictograms)

### ADR (Europe) (Pictograms)

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**Continued on Next Page**
### Section 16. Other Information

<table>
<thead>
<tr>
<th>MSDS Code</th>
<th>D3686</th>
</tr>
</thead>
<tbody>
<tr>
<td>References</td>
<td>Not available.</td>
</tr>
<tr>
<td>Other Special Considerations</td>
<td>Uses: Drug; Drug for chemotherapy; Anthracycline antibiotic.</td>
</tr>
</tbody>
</table>

Verified by Sonia Owen.  
Printed 9/12/2006.

CALL (310) 516-8000

**Notice to Reader**

All chemicals may pose unknown hazards and should be used with caution. This Material Safety Data Sheet (MSDS) applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this MSDS. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this MSDS is based on technical data judged to be reliable, Spectrum Quality Products, Inc. assumes no responsibility for the completeness or accuracy of the information contained herein.