1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product code: T1062
Product Name: TERBUTALINE SULFATE, USP
Chemical Name: Benzyl alcohol, alpha-((tert-butylamino)methyl)-3,5-dihydroxy-, sulfate (2:1)
Synonyms: 1,3-Benzenediol, 5-(2-((1,1-dimethylethyl)amino)-1-hydroxyethyl)-, sulfate (2:1) (salt) 1-(3,5-Dihydroxyphenyl)-2-tert-butylaminoethanol sulphate alpha-((tert-Butylamino)methyl)-3,5-dihydroxybenzyl alcohol sulfate (2:1) (salt) Brethine Bricanyl Terbutaline sulphate
Recommended use: Medicinal products
CAS #: 23031-32-5
Formula: (C12-H19-N-O3)2.H2-SO4
RTECS #: DN9000000
Ci#: Not available
Supplier: Spectrum Chemicals and Laboratory Products, Inc. 14422 South San Pedro St. Gardena, CA 90248 (310) 516-8000
Emergency Telephone Number: CHEMTREC: 1-800-424-9300
Contact Person: Martin LaBenz (West Coast)
Contact Person: Chris Terpak (East Coast)

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW
May cause skin and eye irritation. May cause irritation of respiratory tract.

Physical state: Solid.
Appearance: Crystalline powder.

See Section 8.
2. HAZARDS IDENTIFICATION

OSHA Regulatory Status
This material is not considered hazardous by the OSHA Hazard Communication Standard (29 1910.1200)

POTENTIAL HEALTH EFFECTS

Principal Routes of Exposure:
Inhalation. Ingestion.

Acute Potential Health Effects:

Skin Contact:
May cause skin irritation.

Eye Contact:
Contact with eyes may cause irritation.

Inhalation:
May cause irritation of respiratory tract.

Ingestion:
Ingestion may cause vomiting and nausea. May affect the cardiovascular system. May cause central nervous system effects.

Chronic Potential Health Effects:


Carcinogen Status: No information available

Mutagenic Effects: No information available

Teratogenic Effects: Showed teratogenic effects in animal experiments.

Aggravated Medical Conditions: Hypersensitivity to material, Diabetes, High blood pressure, Irregular heart rate, Heart disease, Hyperthyroidism, Seizures.

See Section 11 for additional Toxicological Information

POTENTIAL ENVIRONMENTAL EFFECTS

No information available

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terbutaline Sulfate</td>
<td>23031-32-5</td>
<td>100</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

General Advice:
Poison information centres in each State capital city can provide additional assistance for scheduled poisons (13 1126)

Skin Contact:
Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. Get medical attention if irritation develops.

Product code: T1062
Product name: TERBUTALINE SULFATE, USP
**Eye Contact:**
Flush eye with water for 15 minutes. Get medical attention if irritation occurs. If symptoms persist, call a physician.

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

**Ingestion:**
Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Consult a physician if necessary.

**Notes to Physician:**
Treat symptomatically

### 5. FIRE-FIGHTING MEASURES

**Flammable Properties**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flashpoint (°C/°F)</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Lower Explosion Limit (%)</td>
<td>No information available</td>
</tr>
<tr>
<td>Upper Explosion Limit (%)</td>
<td>No information available</td>
</tr>
<tr>
<td>Autoignition Temperature (°C/°F)</td>
<td>No information available</td>
</tr>
</tbody>
</table>

**Suitable Extinguishing Media:**
Carbon dioxide (CO2). Dry chemical. Water spray mist or foam.

**Unsuitable Extinguishing Media:**
No information available.

**Hazardous Combustion Products:**
Carbon monoxide; Carbon dioxide; Nitrogen oxides; Sulfur oxides

**Specific hazards:**
May be combustible at high temperatures.

**Special Protective Equipment for Firefighters:**
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear

**Specific Methods:**
No information available.

### 6. ACCIDENTAL RELEASE MEASURES

**Personal Precautions:**
Ensure adequate ventilation. Use personal protective equipment. Avoid contact with skin, eyes and clothing. Avoid dust formation. Remove all sources of ignition.

**Environmental Precautions:**
Do not let product enter drains.

**Methods for Cleaning Up:**
Sweep up and shovel into suitable containers for disposal. Clean contaminated surface thoroughly.

### 7. HANDLING AND STORAGE

**Handling**
**Technical Measures/Precautions:**
Provide sufficient air exchange and/or exhaust in work rooms. Avoid dust formation. Keep away from incompatible materials.

**Safe Handling Advice:**
Wear personal protective equipment. Avoid contact with skin, eyes and clothing. Keep away from heat and sources of ignition. Avoid dust formation. Protect from light. Do not ingest. Do not breathe vapours/dust. Handle in accordance with good industrial hygiene and safety practice.

**Storage**

**Technical Measures/Storage Conditions:**
Keep container tightly closed in a dry and well-ventilated place. Store at room temperature in the original container. Sensitive to light. Store in light-resistant containers. Store away from incompatible materials.

**Incompatible Products:**
Oxidizing agents.

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**8. EXPOSURE CONTROLS / PERSONAL PROTECTION**

**Engineering measures to reduce exposure:**
Ensure adequate ventilation. 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 Protective Equipment**

**Eye protection:**
Safety glasses. Safety glasses with side-shields.

**Skin and body protection:**
Long sleeved clothing. Chemical resistant apron. Gloves.

**Respiratory protection:**
Effective dust mask. Wear respirator with dust filter.

**Hygiene measures:**
Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product. When using, do not eat, drink or smoke.

**National occupational exposure limits**

**United States**
U.S Occupational Exposure Limits: Not determined

**Canada**
Canada Occupational Exposure Limits: Not determined

**Australia and Mexico**
Occupational Exposure Limits for Australia and Mexico: Not determined

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**9. PHYSICAL AND CHEMICAL PROPERTIES**

**Product code:** T1062  
**Product name:** TERBUTALINE SULFATE, USP
9. PHYSICAL AND CHEMICAL PROPERTIES

**Physical state:** Solid

**Appearance:** Crystalline powder.

**Odor:** None. Very faint. Vinegar-like.

**Flash point (°C):** Not determined

**Autoignition Temperature (°C/F):** No information available

**Melting point/range (°C/F):** No information available

**Density (g/cm3):** No information available

**Vapor density:** No information available

**Odor threshold (ppm):** No information available

**Solubility:**
- Soluble in Water
- Slightly soluble in Methanol
- Insoluble in Chloroform

**Molecular weight:** 548.65

**Color:** White. Off-white. Grayish White.

**Boiling point/range (°C/F):** No information available

**Specific gravity:** No information available

**Decomposition temperature (°C/F):** No information available

**Evaporation rate:** No information available

**Partition coefficient (n-octanol/water):** No information available

**Miscibility:** No information available

**pH:** No information available

**Flash point (°C):** Not determined

**Vapor pressure @ 20°C (kPa):** No information available

**VOC content (g/L):** No information available

**Product code:** T1062

**Product name:** TERBUTALINE SULFATE, USP

10. STABILITY AND REACTIVITY

**Stability:** Stable at normal conditions

**Conditions to avoid:** Heat. Exposure to light. Decomposes on exposure to light. Avoid dust formation. Dust may form explosive mixture in air. Fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.

**Materials to avoid:** Strong oxidising agents.

**Hazardous decomposition products:** Carbon monoxide. Carbon dioxide. Nitrogen oxides (NOx). Sulphur oxides.

**Possibility of Hazardous Reactions:** No information available

**Polymerization:** Hazardous polymerisation does not occur

**Corrosivity:** No information available

**Special Remarks on Corrosivity:** No information available

11. TOXICOLOGICAL INFORMATION

**Acute Toxicity**

**Component Information**
**Product Information**

- **LC50/inhalation/rat** = No information available
- **LD50/dermal/rabbit** = No information available
- **LD50/dermal/rat** = Not determined
- **LC50/inhalation/rat** = No information available
- **LC50/inhalation/mouse** = No information available
- **LD50/oral/rat** = 8700 mg/kg
- **LD50/oral/mouse** = 205 mg/kg

**Local Effects**

- **Skin irritation**: May cause skin irritation.
- **Eye irritation**: Contact with eyes may cause irritation.
- **Inhalation**: May cause irritation of respiratory tract.
- **Ingestion**: Ingestion may cause nausea, vomiting. May cause flushing and sweating. May affect behavior/central nervous system (tremors, weakness, dizziness, drowsiness). May affect cardiovascular system (chest discomfort or pain, palpitations, increased heart rate).
- **Sensitization**: No information available

**Chronic Toxicity**

- **Chronic Toxicity**: No information available
- **Carcinogenic effects**: No information available
- **Mutagenic Effects**: No information available
- **Reproductive Effects**: Experiments have shown reproductive toxicity effects on laboratory animals. It is excreted in human milk.
- **Teratogenic Effects**: Showed teratogenic effects in animal experiments.
- **Target Organs**: Lungs. Heart. Central nervous system. Nervous system.

**12. ECOLOGICAL INFORMATION**

**ECOTOXICITY**

- **Toxicity to terrestrial and aquatic plants and animals**: No information available
- **Ecotoxicity effects**: 
- **Aquatic toxicity**: 

**Product code**: T1062  **Product name**: TERBUTALINE SULFATE, USP
13. DISPOSAL CONSIDERATIONS

Waste from residues / unused products:
Waste must be disposed of in accordance with Federal, State and Local regulation.

Contaminated packaging:
Empty containers should be taken for local recycling, recovery or waste disposal.

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Terbutaline Sulfate</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

14. TRANSPORT INFORMATION

DOT
- UN-No: Not regulated
- Proper Shipping Name: No information available
- Hazard Class: No information available
- Packing Group: None
- Subsidiary Risk: Not applicable
- Marine Pollutant: No data available
- ERG No: No information available
- DOT RQ (lbs): No information available

TDG (Canada)
- Proper Shipping Name: No information available
- UN-No: Not regulated
- Hazard Class: No information available
- Packing Group: No information available
- Subsidiary Risk: No information available
- Description: No information available

ADR
- Proper Shipping Name: No information available
- UN-No: Not regulated
- Hazard Class: No information available
- Packing Group: No information available
- Subsidiary Risk: No information available
- Classification Code: No information available
- Description: No information available
- CEFIC Tremcard No: No information available

IMO / IMDG
- Proper Shipping Name: No information available
- UN-No: Not regulated
- Hazard Class: No information available
- Subsidiary Risk: No information available
- Packing Group: No information available
- Description: No information available
- IMDG Page: No information available
- Marine Pollutant: No information available

Product code: T1062  Product name: TERBUTALINE SULFATE, USP
15. REGULATORY INFORMATION

International Inventories

<table>
<thead>
<tr>
<th>Components</th>
<th>U.S. TSCA</th>
<th>Philippines (PICCS)</th>
<th>KOREA KECL</th>
<th>Japan ENCS</th>
<th>CHINA</th>
<th>Australia (AICS)</th>
<th>EINECS-No.</th>
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</thead>
<tbody>
<tr>
<td>Terbutaline Sulfate</td>
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<td>KE-11363</td>
<td>3-2862</td>
<td>Not present</td>
<td>Present</td>
<td>245-386-3</td>
</tr>
</tbody>
</table>

U.S. Regulations


Chemicals Known to the State of California to Cause Cancer:
WARNING: This product contains a chemical known to the State of California to cause cancer. (See table below)

Chemicals Known to the State of California to Cause Reproductive Toxicity:
This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

<table>
<thead>
<tr>
<th>Components</th>
<th>Carcinogen</th>
<th>Developmental Toxicity</th>
<th>Male Reproductive Toxicity</th>
<th>Female Reproductive Toxicity</th>
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</thead>
<tbody>
<tr>
<td>Terbutaline Sulfate</td>
<td>Not Listed</td>
<td>Not Listed</td>
<td>Not Listed</td>
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</tbody>
</table>

CERCLA/SARA

<table>
<thead>
<tr>
<th>Components</th>
<th>CERCLA - Hazardous Substances and their Reportable Quantities</th>
<th>Section 302 Extremely Hazardous Substances and TPQs</th>
<th>Section 302 Extremely Hazardous Substances and RQs</th>
<th>Section 313 - Chemical Category</th>
<th>Section 313 - Reporting de minimis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terbutaline Sulfate</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>
U.S. TSCA

<table>
<thead>
<tr>
<th>Components</th>
<th>TSCA Section 5(a)2 - Chemicals With Significant New Use Rules (SNURS)</th>
<th>TSCA 8(d) - Health and Safety Reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terbutaline Sulfate</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

Canada

WHMIS hazard class:
Non-controlled

Inventory

<table>
<thead>
<tr>
<th>Components</th>
<th>Canada (DSL)</th>
<th>Canada (NDSL)</th>
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</thead>
<tbody>
<tr>
<td>Terbutaline Sulfate</td>
<td>Not Listed</td>
<td>Not Listed</td>
</tr>
</tbody>
</table>

EU Classification

R - phrase(s)
not determined

S - phrase(s)
none

The product is classified in accordance with Annex VI to Directive 67/548/EEC

Indication of danger:
Not dangerous

16. OTHER INFORMATION

The MSDS format complies with ANSI Z400.1-2004 standards.

Revision date: 22-Mar-2010

Reason for revision: Not applicable

Additional advice: Consult your supplier if the material is to be used for special applications such as in the food industry or for hygiene, medical or surgical end-use.

Prepared by: Health & Safety

Literature reference: No information available

Product code: T1062
Product name: TERBUTALINE SULFATE, USP
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. The physical properties reported in this MSDS are obtained from the literature and do not constitute product specifications. Information contained herein does not constitute a warranty, whether expressed or implied, as to the safety, merchantability or fitness of the goods for a particular purpose. Spectrum Chemicals & Laboratory Products, Inc. assumes no responsibility for results obtained or for incidental or consequential damages, including lost profits, arising from the use of these data. No warranty against infringement of any patent, copyright or trademark is made or implied. 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 assumes no responsibility for the completeness or accuracy of the information contained herein.

Product code: T1062

Product name: TERBUTALINE SULFATE, USP