

MATERIAL SAFETY DATA SHEET

| | | |
|------|------|-------------------------------|
| NFPA | HMIS | Personal Protective Equipment |
|------|------|-------------------------------|



| | |
|---------------|---|
| Health Hazard | 1 |
| Fire Hazard | 2 |
| Reactivity | 0 |



See Section 8.

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

| | |
|------------------------------------|--|
| Product code: | A2477 |
| Product Name: | ALPHA-ANGELICALACTONE |
| Chemical Name: | 2(3H)-Furanone, 5-methyl- |
| Synonyms: | beta,gamma-Angelica lactone delta(sup 2)-Angelica lactone gamma-Methyl-beta,gamma-crotonolactone 5-Methyl-2(3H)-furanone 4-Hydroxypent-3-enoic acid lactone 3-Pentenoic acid, 4-hydroxy-, gamma-lactone |
| Recommended use: | No information available. |
| CAS #: | 591-12-8 |
| Formula: | C5-H6-O2 |
| RTECS # | LU5075000 |
| 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: | Regina Wachenheim (East Coast) |

2. HAZARDS IDENTIFICATION

| EMERGENCY OVERVIEW | | | |
|--|-----------------------------------|--|---|
| CAUTION! COMBUSTIBLE LIQUID. May cause skin and eye irritation. May cause irritation of respiratory tract. | | | |
| Odor: No information available | Physical state: Liquid. | Appearance: No information available | Color: Colorless. Light yellow. |

OSHA Regulatory Status

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200)

2. HAZARDS IDENTIFICATION

POTENTIAL HEALTH EFFECTS

Principal Routes of Exposure:

Skin. Eyes. Ingestion.

Acute Potential Health Effects:**Skin Contact:**

May cause skin irritation.

Eye Contact:

May cause eye irritation.

Inhalation:

May cause irritation of respiratory tract.

Ingestion:

Ingestion may cause gastrointestinal irritation, nausea, vomiting, and diarrhoea. May cause central nervous system effects. May affect respiration.

Chronic Potential Health Effects:**Component**

alpha-Angelicalactone
591-12-8 (100)

Carcinogen Status:

No information available

Target Organs: No information available

Teratogenic Effects: No information available

Mutagenic Effects: No information available

Aggravated Medical Conditions: No information available

See Section 11 for additional Toxicological Information

POTENTIAL ENVIRONMENTAL EFFECTS

No information available

3. COMPOSITION/INFORMATION ON INGREDIENTS

| Components | CAS-No. | Weight % |
|-----------------------|----------|----------|
| alpha-Angelicalactone | 591-12-8 | 100 |

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.

| | |
|----------------------------|---|
| 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

| | |
|----------------------------|-----------------------|
| Flashpoint (°C/°F): | 65-68 °C/149-154.4 °F |
|----------------------------|-----------------------|

| |
|---|
| Tested according to: Closed cup |
|---|

| | |
|-----------------------------------|--------------------------|
| Lower Explosion Limit (%): | No information available |
|-----------------------------------|--------------------------|

| | |
|-----------------------------------|--------------------------|
| Upper Explosion Limit (%): | No information available |
|-----------------------------------|--------------------------|

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

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

Specific hazards: Combustible material. May be ignited by heat, sparks or flames. Container explosion may occur under fire conditions or when heated.

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: For larger fires, use water spray or fog. Cool containers with flooding quantities of water until well after fire is out.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions:

Use personal protective equipment. Avoid contact with skin, eyes and clothing. Ensure adequate ventilation. Remove all sources of ignition.

Environmental Precautions:

Do not let product enter drains. Prevent further leakage or spillage if safe to do so.

Methods for Cleaning Up:

Absorb spill with inert material (e.g. vermiculite, dry sand or earth), then place in a suitable chemical waste container. Clean contaminated surface thoroughly.

7. HANDLING AND STORAGE

Handling

Technical Measures/Precautions:

Provide sufficient air exchange and/or exhaust in work rooms. Remove all sources of ignition. Keep away from open flames, hot surfaces and sources of ignition. Keep away from incompatible materials.

Safe Handling Advice:

Wear personal protective equipment. Avoid contact with skin, eyes and clothing. Keep away from open flames, hot surfaces and sources of ignition. Do not ingest. Do not breathe vapors or spray mist. Handle in accordance with good industrial hygiene and safety practice.

Storage

Technical Measures/Storage Conditions:

Keep containers tightly closed in a dry, cool and well-ventilated place. Store at room temperature in the original container. Store away from incompatible materials. Store in a segregated and approved area.

Incompatible Products:

Oxidizing agents.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering measures to reduce exposure:

Ensure adequate ventilation. Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors and mist below their respective threshold limit value.

Personal Protective Equipment

Eye protection: Goggles.

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

Respiratory protection: Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Respiratory protection is not necessary for normal handling. Good room ventilation or use of local exhaust (fume hood) is sufficient. Use a vapor respirator under conditions where exposure to the substance is apparent (e.g. generation of high concentrations of mist or vapor, inadequate ventilation, development of respiratory tract irritation), and engineering controls are not feasible. Be sure to use an approved/certified respirator or equivalent. .

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

National occupational exposure limits**United States**

U.S Occupational Exposure Limits: Not determined

| Components | OSHA | NIOSH | ACGIH | AIHA WHEEL |
|----------------------------------|------|-------|-------|------------|
| alpha-Angelicalactone - 591-12-8 | None | None | None | None |

Canada

Canada Occupational Exposure Limits: Not determined

| Components | Alberta | British Columbia | Ontario | Quebec |
|-----------------------------------|---------|------------------|---------|--------|
| alpha-Angelicalactone 591-12-8 | None | None | None | None |

Australia and Mexico

Occupational Exposure Limits for Australia and Mexico: Not determined

| Components | Australia | Mexico |
|-----------------------------------|-----------|--------|
| alpha-Angelicalactone 591-12-8 | None | None |

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state:

Liquid.

Appearance:

No information available

Color:

Colorless. Light yellow.

Odor:

No information available

Taste

No information available

Molecular/Formula weight:

98.10

Flash point (°C):

65

Lower Explosion Limit (%):

No information available

Upper Explosion Limit (%):

No information available

Autoignition Temperature (°C/°F):

No information available

pH:

No information available

Melting point/range(°C/°F):

No information available

Boiling point/range(°C/°F):

166 °C/330.8 °F

Decomposition temperature(°C/°F):

No information available

Specific gravity:

No information available

Density (g/cm3):

1.092

Bulk density:

No information available

Vapor pressure @ 20°C (kPa):

No information available

Evaporation rate:

No information available

Vapor density:

No information available

VOC content (g/L):

No information available

Odor threshold (ppm):

No information available

**Partition coefficient
(n-octanol/water):**

No information available

Miscibility:

No information available

Solubility:

No information available

10. STABILITY AND REACTIVITY

Stability:

Stable at normal conditions

Conditions to avoid:

Heat. Ignition sources.

Materials to avoid:

Oxidising agents.

Hazardous decomposition products:

Carbon dioxide. Carbon monoxide.

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

alpha-Angelicalactone - 591-12-8

LD50/oral/rat = 3900 mg/kg Oral LD50 Rat
LD50/oral/mouse = No information available
LD50/dermal/rabbit = No information available
LD50/dermal/rat = No information available
LC50/inhalation/rat = No information available
LC50/inhalation/mouse = No information available
Other LD50 or LC50 information =
No information available

Product Information

LC50/inhalation/rat = No information available
LC50/Inhalation/mouse = No information available
LD50/dermal/rabbit = No information available
LD50/dermal/rat = No information available
LD50/oral/mouse = No information available

LD50/oral/rat = No information available

Local Effects

Skin irritation: May cause skin irritation.

Eye irritation: May cause eye irritation

Inhalation: May cause irritation of respiratory tract

Ingestion: Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea. May affect respiration (difficult or labored breathing resulting in shortness of breath). May affect behavior/central nervous system (somnia). May affect behavior/central nervous system (somnia).

Sensitization: No information available

Chronic Toxicity

Chronic Toxicity No information available

Carcinogenic effects: Not considered carcinogenic

| Components | NTP | IARC | OSHA HCS - Carcinogens | ACGIH - Carcinogens | Australia - Prohibited Carcinogenic Substances | Australia - Notifiable Carcinogenic Substances |
|-----------------------|------------|------------|------------------------|---------------------|--|--|
| alpha-Angelicalactone | Not listed | Not listed | Not listed | Not listed | Not listed | Not listed |

Mutagenic Effects: No information available

Reproductive Effects: No information available

Teratogenic Effects: No information available

Target Organs: No information available

12. ECOLOGICAL INFORMATION

ECOTOXICITY

Toxicity to terrestrial and aquatic plants and animals: No information available

Ecotoxicity effects: Not determined.

Aquatic toxicity: No information available

Mobility: No information available

Persistence and degradability: No information available

Bioaccumulative potential: No information available

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

| Components | RCRA - F Series Wastes | RCRA - K Series Wastes | RCRA - P Series Wastes | RCRA - U Series Wastes |
|-----------------------|------------------------|------------------------|------------------------|------------------------|
| alpha-Angelicalactone | None | None | None | None |

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)

UN-No: Not Regulated
Proper Shipping Name: No information available
Hazard Class: No information available
Packing Group: No information available
Subsidiary Risk: No information available
Description: No information available

ADR

UN-No: Not Regulated
Proper Shipping Name: No information available
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

UN-No: Not Regulated
Proper Shipping Name: No information available
Hazard Class: No information available
Packing Group: No information available
Subsidiary Risk: No information available
Description: No information available
IMDG Page: No information available
Marine Pollutant No information available
MFAG: No information available
Maximum Quantity: No information available

RID

UN-No: Not Regulated
Proper Shipping Name: No information available
Hazard Class: No information available
Packing Group: No information available
Subsidiary Risk: No information available
Classification Code: No information available
Description: No information available

ICAO

UN-No: Not Regulated
Proper Shipping Name: No information available
Hazard Class: No information available
Packing Group: No information available
Subsidiary Risk: No information available
Description: No information available

IATA

UN-No: Not Regulated
Proper Shipping Name: No information available
Hazard Class: No information available
Packing Group: No information available
Subsidiary Risk: No information available
Description: No information available

| |
|-----------------------------------|
| 15. REGULATORY INFORMATION |
|-----------------------------------|

International Inventories

| Components | U.S. TSCA | Philippines (PICCS) | KOREA KECL | Japan ENCS | CHINA | Australia (AICS) | EINECS-No. |
|------------------------------|-----------|---------------------|-------------|------------|---------|------------------|------------|
| <i>alpha-Angelicalactone</i> | Present | Present | Not present | (5)-5891 | Present | Present | 209-701-8 |

U.S. Regulations**California Prop. 65: Safe Drinking Water and Toxic Enforcement Act of 1986.****Chemicals Known to the State of California to Cause Cancer:**

This product does not contain a chemical requiring a warning under California Prop. 65. (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)

| Components | Carcinogen | Developmental Toxicity | Male Reproductive Toxicity | Female Reproductive Toxicity: |
|------------------------------|------------|------------------------|----------------------------|-------------------------------|
| <i>alpha-Angelicalactone</i> | Not Listed | Not Listed | Not Listed | Not Listed |

CERCLA/SARA

| Components | CERCLA - Hazardous Substances and their Reportable Quantities | Section 302 Extremely Hazardous Substances and TPQs | Section 302 Extremely Hazardous Substances and RQs | Section 313 - Chemical Category | Section 313 - Reporting <i>de minimis</i> |
|------------------------------|---|---|--|---------------------------------|---|
| <i>alpha-Angelicalactone</i> | None | None | None | None | None |

U.S. TSCA

| Components | TSCA Section 5(a)2 - Chemicals With Significant New Use Rules (SNURS) | TSCA 8(d) -Health and Safety Reporting |
|------------------------------|---|--|
| <i>alpha-Angelicalactone</i> | Not Applicable | Not Applicable |

Canada

WHMIS hazard class:
Non-controlled

Canada Controlled Products Regulation:

This product has been classified according to the hazard criteria of the CPR (Controlled Products Regulation) and the MSDS contains all of the information required by the CPR.

Inventory

| Components | Canada (DSL) | Canada (NDSL) |
|------------------------------|--------------|---------------|
| <i>alpha-Angelicalactone</i> | Present | Not Listed |

| Components | CEPA Schedule I - Toxic Substances | CEPA - 2010 Greenhouse Gases Subject to Mandatory Reporting |
|------------------------------|------------------------------------|---|
| <i>alpha-Angelicalactone</i> | Not listed | Not listed |

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.

| | |
|------------------------------|--------------------------|
| Preparation Date | 01-Oct-2012 |
| Reason for revision: | Not applicable |
| Prepared by: | Sonia Owen |
| Literature reference: | No information available |

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.