SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier
- Trade name: STRONTIUM SULFATE
- Chemical Name: Strontium sulfate
- Synonyms: Celestite
- Molecular formula: SrSO4

1.2 Relevant identified uses of the substance or mixture and uses advised against

Uses of the Substance / Mixture
- Manufacture of pulp, paper and paper products
- Paints & coating
- Plastics industry
- Rubber products

1.3 Details of the supplier of the safety data sheet

Company
SOLVAY FLUORIDES, LLC
3333 RICHMOND AVENUE
77098-3099, HOUSTON
USA
Tel: +1-800-7658292; +1-713-5256700
Fax: +1-713-5257805

Prepared by
Solvay Product Stewardship (see Telephone number above)

Date Prepared
05/08/2015

1.4 Emergency telephone

FOR EMERGENCIES INVOLVING A SPILL, LEAK, FIRE, EXPOSURE OR ACCIDENT CONTACT: CHEMTREC 800-424-9300 within the United States and Canada, or 703-527-3887 for international collect calls.

SECTION 2: Hazards identification

2.1 Emergency overview

Appearance
- Form: powder
- Physical state: solid
- Color: white
- Odor: odorless

Warning statements
- none

2.2 Potential Health Effects
Inhalation effect
- no data available

Skin effect
- no data available

Eye effect
- no data available

Ingestion effect
- no data available

Chronic effects
- This product does not contain any ingredient designated by IARC or ACGIH as probable or suspected human carcinogens.

SECTION 3: Composition/information on ingredients

3.1 Information on Components and Impurities

WHMIS Hazardous Ingredients and Impurities

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Identification number CAS-No.</th>
<th>Concentration [%]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfuric acid, barium salt (1:1)</td>
<td>7727-43-7</td>
<td>&lt; 3</td>
</tr>
</tbody>
</table>

Non Hazardous Ingredients and Impurities

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Identification number CAS-No.</th>
<th>Concentration [%]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strontium sulfate</td>
<td>7759-02-6</td>
<td>&gt;= 97</td>
</tr>
</tbody>
</table>

SECTION 4: First aid measures

4.1 Description of first-aid measures

In case of inhalation
- Move to fresh air.
- If symptoms persist, call a physician.

In case of skin contact
- Wash off with soap and water.

In case of eye contact
- Rinse thoroughly with plenty of water, also under the eyelids.
- If eye irritation persists, consult a specialist.

In case of ingestion
- Rinse mouth with water.
- Do NOT induce vomiting.
4.2 Most important symptoms and effects, both acute and delayed

**In case of inhalation**

**Effects**
- No hazards to be specially mentioned.

**In case of skin contact**

**Effects**
- No hazards to be specially mentioned.
  - *Repeated or prolonged exposure*
    - Contact with dust can cause mechanical irritation or drying of the skin.

**In case of eye contact**

**Effects**
- Dust contact with the eyes can lead to mechanical irritation.

**In case of ingestion**

**Effects**
- Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.

4.3 Indication of any immediate medical attention and special treatment needed

**Notes to physician**
- When symptoms persist or in all cases of doubt seek medical advice.

---

**SECTION 5: Firefighting measures**

<table>
<thead>
<tr>
<th>Flash point</th>
<th>Not applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autoignition temperature</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Flammability / Explosive limit</td>
<td>no data available</td>
</tr>
</tbody>
</table>

5.1 Extinguishing media

**Suitable extinguishing media**
- Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

**Unsuitable extinguishing media**
- None known.

5.2 Special hazards arising from the substance or mixture

**Specific hazards during fire fighting**
- Not combustible.
- Hazardous decomposition products formed under fire conditions.

**Hazardous combustion products:**
- Strontium oxide
- Sulfur oxides

5.3 Advice for firefighters
Special protective equipment for fire-fighters
- In the event of fire, wear self-contained breathing apparatus.
- Use personal protective equipment.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel
- Evacuate personnel to safe areas.
- Avoid dust formation.

Advice for emergency responders
- Use personal protective equipment.
- Sweep up to prevent slipping hazard.
- Prevent further leakage or spillage.

6.2 Environmental precautions
- Should not be released into the environment.
- Local authorities should be advised if significant spillages cannot be contained.

6.3 Methods and materials for containment and cleaning up
- Sweep up and shovel into suitable containers for disposal.

6.4 Reference to other sections
- Refer to protective measures listed in sections 7 and 8.

SECTION 7: Handling and storage

7.1 Precautions for safe handling
- Ensure adequate ventilation.
- Minimize dust generation and accumulation.
- Avoid contact with skin and eyes.
- Keep away from incompatible products

Hygiene measures
- When using do not eat, drink or smoke.
- Wash hands before breaks and at the end of workday.
- Handle in accordance with good industrial hygiene and safety practice.

7.2 Conditions for safe storage, including any incompatibilities

Technical measures/Storage conditions
- Keep in properly labeled containers.
- Keep tightly closed in a dry, cool and well-ventilated place.
- Keep away from:
  - Incompatible products

7.3 Specific end use(s)
SECTION 8: Exposure controls/personal protection

Introductory Remarks: These recommendations provide general guidance for handling this product. Because specific work environments and material handling practices vary, safety procedures should be developed for each intended application. Assistance with selection, use and maintenance of worker protection equipment is generally available from equipment manufacturers.

8.1 Control parameters

**Components with workplace occupational exposure limits**

Consult local authorities for acceptable exposure limits.

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Value type</th>
<th>Value</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Particles not otherwise specified (PNOS)</td>
<td>TWA</td>
<td>10 mg/m³</td>
<td>American Conference of Governmental Industrial Hygienists</td>
</tr>
</tbody>
</table>

Form of exposure: Inhalable fraction
The goal of the TLV®-CS Committee is to recommend TLVs® for all substances for which there is evidence of health effects at airborne concentrations encountered in the workplace. When a sufficient body of evidence exists for a particular substance, a TLV® is established. Thus, by definition the substances covered by this recommendation are those for which little data exist. The recommendation at the end of this Appendix is supplied as a guideline rather than a TLV® because it is not possible to meet the standard level of evidence used to assign a TLV®. In addition, the PNOS TLV® and its predecessors have been misused in the past and applied to any unlisted particles rather than those meeting the criteria listed below. The recommendations in this Appendix apply to particles that: - Do not have an applicable TLV®; - Are insoluble or poorly soluble in water (or, preferably, in aqueous lung fluid if data are available); and - Have low toxicity (i.e. are not cytotoxic, genotoxic or otherwise chemically reactive with lung tissue, and do not emit ionizing radiation, cause immune sensitization, or cause toxic effects other than by inflammation or the mechanism of 'lung overload'). ACGIH® believes that even biologically inert, insoluble, or poorly soluble particles may have adverse effects and recommends that airborne concentrations should be kept below 3 mg/m³, respirable particles, and 10 mg/m³, inhalable particles, until such time as a TLV® is set for a particular substance.

| Particles not otherwise specified (PNOS) | TWA        | 3 mg/m³  | American Conference of Governmental Industrial Hygienists |

Form of exposure: Respirable fraction
The goal of the TLV®-CS Committee is to recommend TLVs® for all substances for which there is evidence of health effects at airborne concentrations encountered in the workplace. When a sufficient body of evidence exists for a particular substance, a TLV® is established. Thus, by definition the substances covered by this recommendation are those for which little data exist. The recommendation at the end of this Appendix is supplied as a guideline rather than a TLV® because it is not possible to meet the standard level of evidence used to assign a TLV®. In addition, the PNOS TLV® and its predecessors have been misused in the past and applied to any unlisted particles rather than those meeting the criteria listed below. The recommendations in this Appendix apply to particles that: - Do not have an applicable TLV®; - Are insoluble or poorly soluble in water (or, preferably, in aqueous lung fluid if data are available); and - Have low toxicity (i.e. are not cytotoxic, genotoxic or otherwise chemically reactive with lung tissue, and do not emit ionizing radiation, cause immune sensitization, or cause toxic effects other than by inflammation or the mechanism of 'lung overload'). ACGIH® believes that even biologically inert, insoluble, or poorly soluble particles may have adverse effects and recommends that airborne concentrations should be kept below 3 mg/m³, respirable particles, and 10 mg/m³, inhalable particles, until such time as a TLV® is set for a particular substance.
Components with workplace occupational exposure limits

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Value type</th>
<th>Value</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfuric acid, barium salt (1:1)</td>
<td>TWA</td>
<td>5 mg/m³</td>
<td>American Conference of Governmental Industrial Hygienists</td>
</tr>
</tbody>
</table>

Form of exposure: Inhalable fraction
Pneumoconiosis, 2014 Adoption. The value is for particulate matter containing no asbestos and < 1% crystalline silica

8.2 Exposure controls

Control measures

Engineering measures
- Provide appropriate exhaust ventilation at places where dust is formed.
- Apply technical measures to comply with the occupational exposure limits.

Individual protection measures

Respiratory protection
- Use NIOSH approved respiratory protection.
- In the case of dust or aerosol formation use respirator with an approved filter.
- Use only respiratory protection that conforms to international/national standards.

Hand protection
- Impervious gloves

Eye protection
- Dust proof goggles, if dusty.

Skin and body protection
- Dust impervious protective suit

Hygiene measures
- When using do not eat, drink or smoke.
- Wash hands before breaks and at the end of workday.
- Handle in accordance with good industrial hygiene and safety practice.

SECTION 9: Physical and chemical properties

Physical and Chemical properties here represent typical properties of this product. Contact the business area using the Product information phone number in Section 1 for its exact specifications.

9.1 Information on basic physical and chemical properties

Appearance
- Form: powder
- Physical state: solid
- Color: white

Odor
- odorless
### Odor Threshold
- no data available

### pH
- no data available

### Melting point/range
- > 2,921 °F (> 1,605 °C)

### Boiling point/boiling range
- Thermal decomposition: yes
- Not applicable

### Flash point
- Not applicable

### Evaporation rate (Butylacetate = 1)
- no data available

### Flammability (solid, gas)
- The product is not flammable.

### Flammability / Explosive limit
- Explosiveness:
- Not explosive

### Autoignition temperature
- Not applicable

### Vapor pressure
- Not applicable

### Vapor density
- Not applicable

### Density
- ca. 3.95 - 4.0 g/ml

### Solubility
- Water solubility:
- < 0.01 g/l slightly soluble

### Partition coefficient: n-octanol/water
- Not applicable

### Thermal decomposition
- > 2,912 °F (> 1,600 °C)

### Viscosity
- Viscosity, dynamic:
- Not applicable

### Explosive properties
- no data available

### Oxidizing properties
- Not considered as oxidizing.

9.2 Other information

#### Molecular weight
- 183.68 g/mol

---

**SECTION 10: Stability and reactivity**

10.1 Reactivity
- none

10.2 Chemical stability
- Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
- No dangerous reaction known under conditions of normal use.

10.4 Conditions to avoid
- none

10.5 Incompatible materials
- Incompatible with acids.

10.6 Hazardous decomposition products
- Strontium oxide
- Sulfur oxides

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Acute oral toxicity
LD50: > 15,000 mg/kg - Rat

Acute inhalation toxicity
no data available

Acute dermal toxicity
LD50: > 2,000 mg/kg - Rat

Acute toxicity (other routes of administration)
no data available

Skin corrosion/irritation
No skin irritation
By analogy
in vitro test
Unpublished reports

Serious eye damage/eye irritation
Rabbit
No eye irritation
Unpublished reports

Respiratory or skin sensitization
By analogy
Local lymph node assay - Mouse
negative
Not classified as sensitizing by skin contact
Unpublished reports
Mutagenicity

Genotoxicity in vitro
In vitro tests did not show mutagenic effects

Genotoxicity in vivo
no data available

Carcinogenicity

By analogy
No carcinogenic effects have been observed

Published data

This product does not contain any ingredient designated as probable or suspected human carcinogens by:

IARC
ACGIH

Toxicity for reproduction and development

Toxicity to reproduction / fertility
no data available

Developmental Toxicity/Teratogenicity
no data available

STOT

STOT-single exposure
no data available

STOT-repeated exposure

The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

By analogy

Oral exposure 90 d - Rat, for males and females
NOAEL: > 104 mg/kg drinking water
Published data

By analogy

Inhalation 90 d - Rat
NOAEC: 0.250 mg/l
Published data

Aspiration toxicity

no data available

Further information

Low acute toxicity
low chronic toxicity.
The product is biologically inert.
SECTION 12: Ecological information

12.1 Toxicity

**Aquatic Compartment**

**Acute toxicity to fish**

The product is biologically inert.

**Acute toxicity to daphnia and other aquatic invertebrates.**

EC50 - 48 h : 24.85 mg/l - Daphnia magna (Water flea)

- internal evaluation
- Published data

**Toxicity to aquatic plants**

ErC50 - 72 h : > 58.81 mg/l - Pseudokirchneriella subcapitata (microalgae)

- Growth rate
- internal evaluation
- Unpublished reports

NOEC - 72 h : >= 58.81 mg/l - Pseudokirchneriella subcapitata (microalgae)

- Growth rate
- internal evaluation
- Unpublished reports

**Toxicity to microorganisms**

EC50 - 3 h : > 858.09 mg/l - activated sludge

- Respiration inhibition
- internal evaluation
- Published data

NOEC - 3 h : >= 858.09 mg/l - activated sludge

- Respiration inhibition
- internal evaluation
- Published data

**Chronic toxicity to daphnia and other aquatic invertebrates.**

NOEC: 4.97 mg/l - 21 d - Daphnia magna (Water flea)

- internal evaluation
- Published data

**Terrestrial Compartment**

**Toxicity to soil dwelling organisms**

NOEC: 442.24 mg/kg - 21 d - Eisenia fetida (earthworms)

- Reproduction Test
- internal evaluation
- Published data

NOEC: 361.67 mg/kg - 28 d - Folsomia candida

- Reproduction Test
- internal evaluation
- Published data

12.2 Persistence and degradability
Abiotic degradation

Photodegradation  inert product in normal environmental conditions
   Medium
   Water
   Soil

Biodegradation

Biodegradability  The methods for determining biodegradability are not applicable to inorganic substances.

12.3 Bioaccumulative potential

Bioconcentration factor (BCF)  Bioaccumulation is unlikely.

12.4 Mobility in soil

Adsorption potential (Koc)  Water/soil
   low solubility and mobility
   potential adsorption
   Air
   mobility as solid aerosols

12.5 Results of PBT and vPvB assessment  no data available

12.6 Other adverse effects  no data available

Ecotoxicity assessment

Acute aquatic toxicity  Harmful to aquatic organisms.

Remarks  Ecological injuries are not known or expected under normal use., Persistent product mainly in its inert form.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product Disposal
   - In accordance with local and national regulations.
   - Dispose of wastes in an approved waste disposal facility.

Advice on cleaning and disposal of packaging
   - Containers that cannot be cleaned must be treated as waste.
   - Must be incinerated in a suitable incineration plant holding a permit delivered by the competent authorities.
SECTION 14: Transport information

**TDG**
not regulated

**DOT**
not regulated

**NOM**
not regulated

**IMDG**
not regulated

**IATA**
not regulated

Note: The above regulatory prescriptions are those valid on the date of publication of this sheet. Given the possible evolution of transportation regulations for hazardous materials, it would be advisable to check their validity with your sales office.

SECTION 15: Regulatory information

15.1 Notification status

<table>
<thead>
<tr>
<th>Inventory Information</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States TSCA Inventory</td>
<td>- Listed on Inventory</td>
</tr>
<tr>
<td>Mexico INSQ (INSQ)</td>
<td>- In compliance with the inventory</td>
</tr>
<tr>
<td>Canadian Domestic Substances List (DSL)</td>
<td>- Listed on Inventory</td>
</tr>
<tr>
<td>New Zealand. Inventory of Chemical Substances</td>
<td>- In compliance with the inventory</td>
</tr>
<tr>
<td>Australia Inventory of Chemical Substances (AICS)</td>
<td>- Listed on Inventory</td>
</tr>
<tr>
<td>Japan. CSCL - Inventory of Existing and New Chemical Substances</td>
<td>- Listed on Inventory</td>
</tr>
<tr>
<td>Korea. Korean Existing Chemicals Inventory (KECI)</td>
<td>- Listed on Inventory</td>
</tr>
<tr>
<td>China. Inventory of Existing Chemical Substances in China (IECSC)</td>
<td>- Listed on Inventory</td>
</tr>
<tr>
<td>Philippines Inventory of Chemicals and Chemical Substances (PICCS)</td>
<td>- Listed on Inventory</td>
</tr>
</tbody>
</table>

15.2 WHMIS (Workplace Hazardous Materials Information System) Classification

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

**Classification**
Not listed

15.3 Other regulations

no data available
SECTION 16: Other information

NFPA (National Fire Protection Association) - Classification

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Health</td>
<td>1 slight</td>
</tr>
<tr>
<td>Flammability</td>
<td>0 minimal</td>
</tr>
<tr>
<td>Instability or Reactivity</td>
<td>0 minimal</td>
</tr>
<tr>
<td>Special Notices</td>
<td>None</td>
</tr>
</tbody>
</table>

HMIS (Hazardous Materials Identification System (Paint & Coating)) - Classification

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>Health</td>
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<td>0 minimal</td>
</tr>
<tr>
<td>Reactivity</td>
<td>0 minimal</td>
</tr>
<tr>
<td>PPE</td>
<td>Determined by User; dependent on local conditions</td>
</tr>
</tbody>
</table>

Key or legend to abbreviations and acronyms used in the safety data sheet

- TWA 8-hour, time-weighted average
- ACGIH American Conference of Governmental Industrial Hygienists
- OSHA Occupational Safety and Health Administration
- NTP National Toxicology Program
- IARC International Agency for Research on Cancer
- NIOSH National Institute for Occupational Safety and Health

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information, and belief at the date of its publication. Such information is only given as a guidance to help the user handle, use, process, store, transport, dispose, and release the product in satisfactory safety conditions and is not to be considered as a warranty or quality specification. It should be used in conjunction with technical sheets but do not replace them. Thus, the information only relates to the designated specific product and may not be applicable if such product is used in combination with other materials or in any other manufacturing process, unless otherwise specifically indicated. It does not release the user from ensuring he is in conformity with all regulations linked to its activity.