

STRONTIUM CARBONATE F

Revision Date 05/08/2015

SECTION 1: Identification of the substance/mixture and of the company/undertaking**1.1 Product identifier**

- Trade name STRONTIUM CARBONATE F

1.2 Relevant identified uses of the substance or mixture and uses advised against**Uses of the Substance / Mixture**

- Manufacture of pyrotechnical products
- Use in welding electrode coating
- Manufacture of glazes, frits and enamels
- Manufacture of ceramics
- Manufacture of electro-ceramic materials
- Manufacture of other strontium compounds
- Use in zinc electrolysis

Uses advised against

- none

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

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

Although OSHA has not adopted the environmental portion of the GHS regulations, this document may include information on environmental effects.

2.1 Classification of the substance or mixture**HCS 2012 (29 CFR 1910.1200)**

- Not a hazardous product according to the OSHA Globally Harmonized System (GHS)

2.2 Label elements**HCS 2012 (29 CFR 1910.1200)**

- Not a hazardous product according to the OSHA Globally Harmonized System (GHS)

STRONTIUM CARBONATE F

Revision Date 05/08/2015

2.3 Other hazards which do not result in classification

- Product dust may be irritating to eyes, skin and respiratory system.
- Possible risk of irreversible effects through inhalation.
- Risk of pulmonary overload (respirable particulates)
- Harmful: possible risk of irreversible effects through inhalation.
- Chronic exposure to the product can cause bone calcification disorders.

SECTION 3: Composition/information on ingredients**3.1 Substance****Hazardous Ingredients and Impurities**

| Chemical Name | Identification number CAS-No. | Concentration [%] |
|------------------|----------------------------------|-------------------|
| Barium carbonate | 513-77-9 | <= 2.5 |

The specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret.

Non Hazardous Ingredients and Impurities

| Chemical Name | Identification number CAS-No. | Concentration [%] |
|---------------------|----------------------------------|-------------------|
| Strontium carbonate | 1633-05-2 | >= 96 |

3.2 Mixture

Not applicable, this product is a substance.

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**

- May cause nose, throat, and lung irritation.

P03000021632

Version : 1.05 / US (Z8)

www.solvay.com



Repeated or prolonged exposure

- Risk of pulmonary overload (respirable particulates)
- Possible risk of irreversible effects through inhalation.

In case of skin contact**Effects**

- Prolonged skin contact may cause skin irritation.

In case of eye contact**Effects**

- Contact with eyes may cause 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

- no data available

SECTION 5: Firefighting measures**Flash point**

Not applicable

Autoignition temperature

Not applicable

Flammability / Explosive limit

no data available

5.1 Extinguishing media**Suitable extinguishing media**

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

Unsuitable extinguishing media

- None.

5.2 Special hazards arising from the substance or mixture**Specific hazards during fire fighting**

- Not combustible.

Hazardous combustion products:

- Strontium oxide
- Barium oxide

5.3 Advice for firefighters**Special protective equipment for fire-fighters**

- In the event of fire, wear self-contained breathing apparatus.

SECTION 6: Accidental release measures**6.1 Personal precautions, protective equipment and emergency procedures**

P03000021632

Version : 1.05 / US (Z8)

www.solvay.com



Advice for non-emergency personnel

- Evacuate personnel to safe areas.
- Avoid dust formation.

Advice for emergency responders

- 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**

- Store in original container.
- Store in a well-ventilated place.
- Keep in a dry place.
- Keep container closed.

- Keep away from:
- Incompatible products

Packaging material**Suitable material**

- Paper.
- Polyethylene

7.3 Specific end use(s)

- Contact your supplier for additional information

STRONTIUM CARBONATE F

Revision Date 05/08/2015

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**

| Ingredients | Value type | Value | Basis |
|------------------|----------------------|-----------------------|--|
| Barium carbonate | TWA | 0.5 mg/m ³ | Occupational Safety and Health Administration - Table Z-1 Limits for Air Contaminants |
| | Expressed as :Barium | | |
| Barium carbonate | TWA | 0.5 mg/m ³ | American Conference of Governmental Industrial Hygienists |
| | Expressed as :Barium | | |
| Barium carbonate | TWA | 0.5 mg/m ³ | National Institute for Occupational Safety and Health |
| | Expressed as :Barium | | |

NIOSH IDLH (Immediately Dangerous to Life or Health Concentrations)

| Ingredients | CAS-No. | Concentration |
|------------------|----------|------------------------------|
| Barium carbonate | 513-77-9 | 50 milligram per cubic meter |

8.2 Exposure controls**Control measures****Engineering measures**

- Provide appropriate exhaust ventilation at places where dust is formed.

Individual protection measures**Respiratory protection**

- Use only respiratory protection that conforms to international/ national standards.
- Use NIOSH approved respiratory protection.
- Respirator with a particle filter (EN 143)

Hand protection

- Wear suitable gloves.

Suitable material

- PVC
- Natural Rubber

Unsuitable material

- Do not wear neoprene gloves, as neoprene absorbs nanoparticles.

Eye protection

- Goggles

Skin and body protection

- Dust impervious protective suit
- PVC
- Suitable material
- PVC

STRONTIUM CARBONATE F

Revision Date 05/08/2015

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

| | |
|---|---|
| <u>Appearance</u> | <p><u>Form:</u> hygroscopic, powder, pellets</p> <p><u>Physical state:</u> solid</p> <p><u>Color:</u> white</p> |
| <u>Particle size</u> | <p>0.74 - 10 µm</p> <p>d 50, nano particles, powder</p> <p>> 0.15 - 0.85 mm (80 %)</p> <p>pellets</p> |
| <u>Odor</u> | odorless |
| <u>Odor Threshold</u> | no data available |
| <u>pH</u> | <p>7.0 - 8.0 (68 °F (20 °C))</p> <p>saturated aqueous solution</p> <p><u>pKa:</u></p> <p>Not applicable</p> |
| <u>Melting point/range</u> | <p>Decomposition: yes</p> <p>Not applicable</p> |
| <u>Boiling point/boiling range</u> | <p>Thermal decomposition: yes</p> <p>Not applicable</p> |
| <u>Flash point</u> | Not applicable |
| <u>Evaporation rate (Butylacetate = 1)</u> | Not applicable |
| <u>Flammability (solid, gas)</u> | The product is not flammable. |
| <u>Flammability / Explosive limit</u> | <p><u>Explosiveness:</u></p> <p>Not explosive</p> |
| <u>Autoignition temperature</u> | Not applicable |
| <u>Vapor pressure</u> | Not applicable |
| <u>Vapor density</u> | Not applicable |
| <u>Density</u> | <u>Bulk density:</u> 300 - 700 kg/m ³ |

P03000021632

Version : 1.05 / US (Z8)

www.solvay.com



STRONTIUM CARBONATE F

Revision Date 05/08/2015

powder

1,200 - 2,000 kg/m³
pelletsRelative density: 3.79**Solubility**Water solubility :
3.4 mg/l (68 °F (20 °C))
slightly soluble**Partition coefficient: n-octanol/water**

Not applicable

Thermal decomposition

ca. 1233 °F (667 °C)

ViscosityViscosity, dynamic : Not applicable**Explosive properties**

no data available

Oxidizing properties

Not considered as oxidizing.

9.2 Other information**Molecular weight**

147.6 g/mol

SECTION 10: Stability and reactivity**10.1 Reactivity**

- Risk of violent reaction.

10.2 Chemical stability

- Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

- Contact with acids liberates CO₂, sometimes violently.

10.4 Conditions to avoid

- none

10.5 Incompatible materials

- Acids

10.6 Hazardous decomposition products

- Strontium oxide
- Barium oxide

STRONTIUM CARBONATE F

Revision Date 05/08/2015

SECTION 11: Toxicological information**11.1 Information on toxicological effects****Acute toxicity****Acute oral toxicity**

Strontium nitrate LD50 : > 2,000 mg/kg - Rat

Strontium chloride anhydrous LD50 : > 2,000 mg/kg - Rat
Test substance: Strontium nitrate**Acute inhalation toxicity**

Strontium nitrate LC50 - 4 h : 4.5 mg/l - Rat

Strontium chloride anhydrous LC50 : 4.5 mg/l - Rat
Test substance: Strontium nitrate**Acute dermal toxicity**

study scientifically unjustified

Acute toxicity (other routes of administration)

no data available

Skin corrosion/irritation

Strontium chloride anhydrous Skin irritation

Serious eye damage/eye irritation

Strontium chloride anhydrous Eye irritation

Respiratory or skin sensitizationStrontium chloride anhydrous not sensitizing
Test substance: Strontium Chloride Hexahydrate**Mutagenicity****Genotoxicity in vitro**

Strontium nitrate In vitro tests did not show mutagenic effects

Strontium chloride anhydrous Test substance: Strontium nitrate
In vitro tests did not show mutagenic effects**Genotoxicity in vivo**

no data available

Carcinogenicity

Strontium nitrate Animal testing did not show any carcinogenic effects.

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

NTP
IARC
OSHA
ACGIH

STRONTIUM CARBONATE F

Revision Date 05/08/2015

Toxicity for reproduction and development**Toxicity to reproduction / fertility**

Strontium nitrate Animal testing did not show any effects on fertility.

observed effect
Developmental Toxicity

Strontium chloride anhydrous Animal testing did not show any effects on fertility.

Developmental Toxicity/Teratogenicity

Strontium nitrate Developmental Toxicity
observed effect

Strontium chloride anhydrous Developmental Toxicity
observed effect

STOT**STOT-single exposure**

Strontium chloride anhydrous no observed effect

STOT-repeated exposure

Oral Repeated exposure - Rat
Target Organs: Skeleton
observed effect

Inhalation Single exposure - Rat
Target Organs: Respiratory system
observed effect

Oral - Rat
LOAEL: 634 mg/kg
Target Organs: Skeleton

CMR effects**Carcinogenicity**

Strontium chloride anhydrous Animal testing did not show any carcinogenic effects.

Teratogenicity

Strontium nitrate Did not show teratogenic effects in animal experiments.

Aspiration toxicity

no data available

Further information

Strontium chloride anhydrous No data is available on the product itself.

SECTION 12: Ecological information**12.1 Toxicity****Aquatic Compartment****Acute toxicity to fish**

Aquatic toxicity is unlikely due to low solubility.

Toxicity to aquatic plants

Strontium nitrate

NOEC - 72 h : ≥ 104.5 mg/l - Pseudokirchneriella subcapitata (green algae)
Growth rate

Strontium chloride anhydrous

EC50 - 72 h : > 104.7 mg/l - Pseudokirchneriella subcapitata (microalgae)
Test substance: Strontium nitrateNOEC - 72 h : ≥ 104.7 mg/l - Pseudokirchneriella subcapitata (microalgae)
Test substance: Strontium nitrate**Chronic toxicity to fish**NOEC: ≥ 100 mg/l - 34 Days - Brachydanio rerio (zebrafish)
mortality
fish larvae**Chronic toxicity to daphnia and other aquatic invertebrates.**

Strontium chloride anhydrous

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

12.2 Persistence and degradability**Abiotic degradation****Photodegradation**

slow ionization and cation precipitation in presence of sulfates or carbonates

Medium

Water

Soil

considerable adsorption

Medium

Soil

Biodegradation**Biodegradability**

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

12.3 Bioaccumulative potential**Bioconcentration factor (BCF)**

potential accumulation of the cation

12.4 Mobility in soil**Adsorption potential (Koc)**

Water/soil

low solubility and mobility

STRONTIUM CARBONATE F

Revision Date 05/08/2015

12.5 Results of PBT and vPvB assessment no data available

12.6 Other adverse effects no data available

SECTION 13: Disposal considerations**13.1 Waste treatment methods****Product Disposal**

- Where possible recycling is preferred to disposal or incineration.
- If recycling is not practicable, dispose of in compliance with local regulations.
- Must be incinerated in a suitable incineration plant holding a permit delivered by the competent authorities.
- Dispose of wastes in an approved waste disposal facility.
- In accordance with local and national regulations.

Waste Code

- Environmental Protection Agency
- Hazardous Waste – YES

- RCRA Hazardous Waste (40 CFR 302)
- D005 - Barium

Advice on cleaning and disposal of packaging

- Dispose of as unused product.
- Where possible recycling is preferred to disposal or incineration.

SECTION 14: Transport information**DOT**

not regulated

TDG

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.

STRONTIUM CARBONATE F

Revision Date 05/08/2015

SECTION 15: Regulatory information**15.1 Notification status**

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

15.2 Federal Regulations**US. EPA EPCRA SARA Title III****Section 313 Toxic Chemicals (40 CFR 372.65)**

The following components are subject to reporting levels established by SARA Title III, Section 313:

| Ingredients | CAS-No. | Concentration |
|------------------|----------|---------------|
| Barium carbonate | 513-77-9 | 2.5 % |

Section 302 Emergency Planning Extremely Hazardous Substance Threshold Planning Quantity (40 CFR 355)

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

Section 302 Emergency Planning Extremely Hazardous Substance Reportable Quantity (40 CFR 355)

This material does not contain any components with a SARA 302 RQ.

Section 304 Emergency Release Notification Reportable Quantity (40 CFR 355)

This material does not contain any components with a section 304 EHS RQ.

US. EPA CERCLA Hazardous Substances and Reportable Quantities (40 CFR 302.4)

This material does not contain any components with a CERCLA RQ.

15.3 State Regulations**US. California Safe Drinking Water & Toxic Enforcement Act (Proposition 65)**

This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

STRONTIUM CARBONATE F

Revision Date 05/08/2015

SECTION 16: Other information**NFPA (National Fire Protection Association) - Classification**

| | |
|---------------------------|-----------|
| Health | 1 slight |
| Flammability | 0 minimal |
| Instability or Reactivity | 0 minimal |
| Special Notices | None |

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

| | |
|--------------|---|
| Health | 1 slight |
| Flammability | 0 minimal |
| Reactivity | 0 minimal |
| PPE | Determined by User; dependent on local conditions |

Further information

- Product evaluated under the US GHS format.

Date Prepared: 05/08/2015**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.