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

1.1 Product identifier
- Trade name: CALCIUM FLUORIDE, SYNTHETIC
- Chemical name: Calcium fluoride
- Molecular formula: CaF2

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

Uses of the Substance / Mixture:
- Metallurgy
- Glass industry
- Dental application
- Brakes
- Chemical industry
- Food/ feedstuff additives
- Plastics industry
- Manufacture of pulp, paper and paper products
- Electroplating agents
- Pharmaceuticals
- Textile industry
- Water treatment
- photographic chemical

1.3 Details of the supplier of the safety data sheet

Company
SOLVAY FLUORIDES, LLC
3737 Buffalo Speedway,
Suite 800,
Houston, TX 77098
USA
Tel: 800-515-6065

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).
2.3 Other hazards which do not result in classification

- Hazardous decomposition products formed under fire conditions.
- Gaseous hydrogen fluoride (HF).

SECTION 3: Composition/information on ingredients

3.1 Substance

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>Calcium fluoride (CaF2)</td>
<td>7789-75-5</td>
<td>&gt;= 99 - &lt; 100</td>
</tr>
</tbody>
</table>

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

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.
- Wash contaminated clothing before re-use.
- If symptoms persist, call a physician.

**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**
- Consult a physician.
- If victim is conscious:
  - If swallowed, rinse mouth with water (only if the person is conscious).
- If victim is unconscious:
  - Oxygen or artificial respiration if needed.

4.2 Most important symptoms and effects, both acute and delayed

**In case of inhalation**
- Product dust may be irritating to eyes, skin and respiratory system.
Effects
- Not a respiratory irritant
- Chronic exposure (to the product) at high concentrations can cause bone fluorosis.

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
Symptoms
- At high concentrations:
  - Stomach/intestinal disorders

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician
- If accidentally swallowed obtain immediate medical attention.
- When symptoms persist or in all cases of doubt seek medical advice.

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.
- The product is not flammable.
- Heating can release hazardous gases.

Hazardous combustion products:
- Hydrogen fluoride

5.3 Advice for firefighters
Special protective equipment for fire-fighters
- In the event of fire, wear self-contained breathing apparatus.
- Fire fighters must wear fire resistant personnel protective equipment.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel
- Avoid dust formation.

Advice for emergency responders
- Sweep up to prevent slipping hazard.

6.2 Environmental precautions
- The product should not be allowed to enter drains, water courses or the soil.
- In case of accidental release or spill, immediately notify the appropriate authorities if required by Federal, State/Provincial and local laws and regulations.
- Should not be released into the environment.

6.3 Methods and materials for containment and cleaning up
- Sweep up and shovel into suitable containers for disposal.
- Avoid dust formation.
- Keep in properly labeled containers.
- Keep in suitable, closed containers for disposal.
- Treat recovered material as described in the section "Disposal considerations".

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.
- Keep away from incompatible products
- Keep away from heat and sources of ignition.

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.
- Keep in a well-ventilated place.
- Keep in a dry place.
- Keep container closed.
- Avoid dust formation.
- Refer to protective measures listed in sections 7 and 8.
- Keep away from:
  - Incompatible products

Packaging material
Suitable material
- Paper
- Polyethylene

Unsuitable material
- no data available

7.3 Specific end use(s)
- Contact your supplier for additional information

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

<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>15 mg/m³</td>
<td>Occupational Safety and Health Administration - Table Z-1 Limits for Air Contaminants</td>
</tr>
<tr>
<td>Particles not otherwise specified (PNOS)</td>
<td>TWA</td>
<td>5 mg/m³</td>
<td>Occupational Safety and Health Administration - Table Z-1 Limits for Air Contaminants</td>
</tr>
<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>

FORMS

PNOS: Particles not otherwise specified
PNOR: Particulates Not Otherwise Regulated
PNOS: Particles not otherwise specified
SAFETY DATA SHEET

CALCIUM FLUORIDE, SYNTHETIC

Revision Date 12/19/2017

Particles not otherwise specified (PNOS) | TWA | 3 mg/m³ | American Conference of Governmental Industrial Hygienists
Form of exposure : Respirable fraction

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>CAS-No.</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium fluoride (CaF₂)</td>
<td>7789-75-5</td>
<td>250 milligram per cubic meter</td>
</tr>
</tbody>
</table>

American Conference of Governmental Industrial Hygienists

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Value type</th>
<th>Value</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium fluoride (CaF₂)</td>
<td>BEI</td>
<td>2 mg/l Fluoride Urine Prior to shift (16 hours after exposure ceases)</td>
<td>American Conference of Governmental Industrial Hygienists</td>
</tr>
</tbody>
</table>

National Institute for Occupational Safety and Health

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Value type</th>
<th>Value</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium fluoride (CaF₂)</td>
<td>BEI</td>
<td>3 mg/l Fluoride Urine End of shift (As soon as possible after exposure ceases)</td>
<td>American Conference of Governmental Industrial Hygienists</td>
</tr>
</tbody>
</table>

8.2 Exposure controls

Control measures

Engineering measures
- Refer to protective measures listed in sections 7 and 8.
- 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
- In the case of dust or aerosol formation use respirator with an approved filter.
- Use only respiratory protection that conforms to international/ national standards.
- Use NIOSH approved respiratory protection.

Hand protection
- Wear suitable gloves.
Suitable material
- PVC
- Neoprene
- Natural Rubber

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: Crystalline powder, hygroscopic
- Physical state: solid
- Color: white
- Particle size: < 0.06 mm (98 %)

**Odor**
- odorless

**Odor Threshold**
- no data available

**Molecular weight**
- 78 g/mol

**pH**
- ca. 6.0 - 7.0 (0.01 g/l) (68 °F (20 °C))

**pKa**
- Not applicable

**Melting point/freezing point**
- Melting point/range: 2,593 °F (1,423 °C)

**Initial boiling point and boiling range**
- Boiling point/boiling range: 4,532 °F (2,500 °C) (759.81 mmHg (1,013 hPa))

**Flash point**
- Not applicable

**Evaporation rate (Butylacetate = 1)**
- Not applicable

**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: Bulk density: 650 - 700 kg/m³
Relative density: 3.18
Solubility: Water solubility: 0.017 g/l (64 °F (18 °C))
Partition coefficient: n-octanol/water: Not applicable, inorganic
Decomposition temperature: no data available
Viscosity: Dynamic viscosity: Not applicable
Explosive properties: no data available
Oxidizing properties: Not considered as oxidizing.

9.2 Other information: no data available

SECTION 10: Stability and reactivity

10.1 Reactivity: no data available
10.2 Chemical stability:
- Stable under recommended storage conditions.
10.3 Possibility of hazardous reactions: no data available
10.4 Conditions to avoid:
- To avoid thermal decomposition, do not overheat.
10.5 Incompatible materials:
- Strong acids
10.6 Hazardous decomposition products:
- Hydrogen fluoride
SECTION 11: Toxicological information

11.1 Information on toxicological effects

**Acute toxicity**

**Acute oral toxicity**
- LD50: >2,000 mg/kg - Rat, female
- Method: OECD Test Guideline 423
- Not classified as hazardous for acute oral toxicity according to GHS.
- No mortality observed at this concentration.
- Unpublished internal reports

**Acute inhalation toxicity**
- LC50 - 4 h (Dust): >5,070 mg/m³ - Rat, male and female
- Method: OECD Test Guideline 403
- Not classified as hazardous for acute inhalation toxicity according to GHS.
- Unpublished internal reports

**Acute dermal toxicity**
- study scientifically unjustified

**Acute toxicity (other routes of administration)**
- no data available

**Skin corrosion/irritation**
- Rabbit
- No skin irritation
- Method: OECD Test Guideline 404
- Unpublished internal reports

**Serious eye damage/eye irritation**
- Rabbit
- No eye irritation
- Method: OECD Test Guideline 405
- Unpublished internal reports

**Respiratory or skin sensitization**
- Local lymph node assay - Mouse
- Does not cause skin sensitization.
- Method: OECD Test Guideline 429
- Unpublished internal reports
Mutagenicity

Genotoxicity in vitro

Ames test
with and without metabolic activation
negative
Method: OECD Test Guideline 471
Unpublished internal reports

Chromosome aberration test in vitro
Strain: Chinese hamster lung cells
with and without metabolic activation
negative
Method: OECD Test Guideline 473
Unpublished internal reports

Gene mutation assays in mammalian cells.
Strain: Chinese hamster lung cells
with and without metabolic activation
negative
Method: OECD Test Guideline 476
Unpublished internal reports

Genotoxicity in vivo
no data available

Carcinogenicity

By analogy

Test substance: Sodium fluoride
No carcinogenic effects have been observed

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

Toxicity for reproduction and development

Toxicity to reproduction / fertility
By analogy
The product is not considered to affect fertility., Test substance, Sodium fluoride

Developmental Toxicity/Teratogenicity
By analogy
The product is not considered to be toxic for development.
STOT

STOT-single exposure
The substance or mixture is not classified as specific target organ toxicant, single exposure according to GHS criteria.

STOT-repeated exposure
The substance or mixture is not classified as specific target organ toxicant, repeated exposure according to GHS criteria.

By analogy
Inhalation 28-day - Rat, male and female
NOAEC: 7 mg/m3
Test substance: Aluminum fluoride
Method: OECD Test Guideline 412
Unpublished internal reports

Experience with human exposure
no data available

Aspiration toxicity
no data available

SECTION 12: Ecological information

12.1 Toxicity

Aquatic Compartment

Acute toxicity to fish
no data available

Acute toxicity to daphnia and other aquatic invertebrates.
no data available

Toxicity to aquatic plants
no data available

Toxicity to microorganisms
no data available

Chronic toxicity to fish
no data available

Chronic toxicity to daphnia and other aquatic invertebrates.
no data available

Chronic Toxicity to aquatic plants
no data available

12.2 Persistence and degradability

Abiotic degradation
Stability in water

Water/soil, hydrolyzes, Degradation products: hydrofluoric acid
Water/soil, inert product in normal environmental conditions

Physical- and photo-chemical elimination

no data available

Biodegradation

Biodegradability

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

12.3 Bioaccumulative potential

Partition coefficient: n-octanol/water

Not applicable, inorganic substance

Bioconcentration factor (BCF)

Not applicable, inorganic substance

12.4 Mobility in soil

Adsorption potential (Koc)

Water/soil
low solubility and mobility

Soil/sediments
adsorption on mineral and organic soil constituents

Known distribution to environmental compartments

no data available

12.5 Results of PBT and vPvB assessment

Not applicable

12.6 Other adverse effects

Ecotoxicity assessment

Acute aquatic toxicity
No toxicity at the limit of solubility.

Chronic aquatic toxicity
No toxicity at the limit of solubility.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product Disposal
- In accordance with local and national regulations.
- Can be landfilled, when in compliance with local regulations.

**Waste Code**
- Environmental Protection Agency
- Hazardous Waste – NO

**Advice on cleaning and disposal of packaging**
- Can be landfilled or incinerated, when in compliance with local regulations.
- Where possible recycling is preferred to disposal or incineration.
- The empty and clean containers are to be reused in conformity with regulations.
- Uncleaned empty packaging
- Dispose of as unused product.

### 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.
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>- Not in compliance with the 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>
<tr>
<td>EU. European Registration, Evaluation, Authorisation and Restriction of Chemical (REACH)</td>
<td>- If product is purchased from Solvay in Europe it is in compliance with REACH, if not please contact the supplier.</td>
</tr>
</tbody>
</table>

15.2 Federal Regulations

**US. EPA EPCRA SARA Title III**

**SARA HAZARD DESIGNATION SECTIONS 311/312 (40 CFR 370)**

No SARA Hazards

**Section 313 Toxic Chemicals (40 CFR 372.65)**

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

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

This material does not contain any components with a section 302 EHS TPQ.

**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.
SECTION 16: Other information

NFPA (National Fire Protection Association) - Classification
- Health: 0 minimal
- Flammability: 0 minimal
- Instability or Reactivity: 0 minimal
- Special Notices: None

HMIS (Hazardous Materials Identification System (Paint & Coating)) - Classification
- Health: 0 minimal
- 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: 12/19/2017

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.