**SAFETY DATA SHEET**
North American Version

# FLUOROSILICIC ACID

## 1. PRODUCT AND COMPANY IDENTIFICATION

### 1.1. Identification of the substance or mixture

| | | |
|---|---|---|
| Product name | : | FLUOROSILICIC ACID |
| Product grade(s) | : | FLUOROSILICIC ACID, 23-25%<br>FLUOROSILICIC ACID, 40 % |
| Synonyms | : | Fluorosilicic Acid, Fluosilicic Acid, Hydrofluorosilicic Acid |
| Molecular formula | : | H2SiF6 |

### 1.2. Use of the Substance/Mixture

Recommended use : - Chemical intermediate
- Water treatment

### 1.3. Company/Undertaking Identification

Address : SOLVAY FLUORIDES, LLC
3333 RICHMOND AVENUE
HOUSTON TX 77098-3099
United States

### 1.4. Emergency and contact telephone numbers

**Emergency telephone number** : **1 (800) 424-9300 CHEMTREC ® (USA & Canada)**
**01-800-00-214-00 (MEX. REPUBLIC)**

**Contact telephone number (product information):** : **US: +1-800-765-8292 (Product information)**
**US: +1-713-525-6500 (Product information)**

## 2. HAZARDS IDENTIFICATION

### 2.1. Emergency Overview:

NFPA : H= 3 F= 0 I= 1 S= None
HMIS : H= 3 F= 0 R= 1 PPE = Supplied by User; dependent on local conditions

***General Information***

Appearance : liquid
Colour : colourless
Odour : pungent

***Main effects***

- Hazardous decomposition products formed under fire conditions.
- Corrosive
- Harmful by inhalation, in contact with skin and if swallowed.

### 2.2. Potential Health Effects:

***Inhalation***




SOLVAY Fluorides

SOLVAY

- Inhalation of vapours is irritating to the respiratory system, may cause throat pain and cough.
- Breathing difficulties
- Aspiration may cause pulmonary oedema and pneumonitis.
- At high concentrations, risk of hypocalcemia with nervous problems (tetany) and cardiac arrhythmia.
- Repeated or prolonged exposure: sore throat, Nose bleeding, chronic bronchitis.

***Eye contact***

- May cause permanent eye injury.
- May cause blindness.
- Intoxication hazards by simultaneous inhalation of the product.
- Symptoms: Burn, Lachrymation, Redness, Swelling of tissue.

***Skin contact***

- Causes severe burns.
- Risk of shock.
- In case of contact with fingernails, severe pain after several hours.
- Risk of hypocalcemia following the extent of the lesions.
- Intoxication hazards by simultaneous inhalation of the product.
- Symptoms: Irritation, Redness, Swelling of tissue.

***Ingestion***

- If ingested, severe burns of the mouth and throat, as well as a danger of perforation of the oesophagus and the stomach.
- Risk of throat (o)edema and suffocation.
- Risk of chemical pneumonitis from product inhalation.
- risk of hypocalcemia with nervous problems (tetany) and cardiac arrhythmia
- Risk of convulsions, loss of consciousness, deep coma and cardiopulmonary arrest.
- Symptoms: Nausea, Bloody vomiting, Abdominal pain, Diarrhoea, Cough, Severe shortness of breath.

***Other toxicity effects***

- See section 11: Toxicological Information

**2.3. Environmental Effects:**

- See section 12: Ecological Information

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

**Hydrogen fluoride**

| | | |
|---|---|---|
| CAS-No. | : | 7664-39-3 |
| **Concentration** | : | **<= 1.0 %** |

**Hexafluorosilicic acid**

| | | |
|---|---|---|
| CAS-No. | : | 16961-83-4 |
| **Concentration** | : | **>= 23.0 - <= 40.0 %** |

## 4. FIRST AID MEASURES

**4.1. Inhalation**

- In case of accident by inhalation: remove casualty to fresh air and keep at rest.
- Oxygen or artificial respiration if needed.
- Victim to lie down in the recovery position, cover and keep him warm.
- Call a physician immediately.
- Take victim immediately to hospital.

**4.2. Eye contact**

- Immediate medical attention is required.
- Take victim immediately to hospital.

- Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.
- In the case of difficulty of opening the lids, administer an analgesic eye wash (oxybuprocaine).

### 4.3. Skin contact

- Call a physician immediately.
- Take victim immediately to hospital.
- Take off contaminated clothing and shoes immediately.
- Wash off with plenty of water.
- Keep warm and in a quiet place.

### 4.4. Ingestion

- Call a physician immediately.
- Take victim immediately to hospital.

***If victim is conscious:***

- If swallowed, rinse mouth with water (only if the person is conscious).
- Do NOT induce vomiting.
- Artificial respiration and/or oxygen may be necessary.

***If victim is unconscious but breathing:***

- Oxygen or artificial respiration if needed.

## 5. FIREFIGHTING MEASURES

### 5.1. Suitable extinguishing media

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

### 5.2. Extinguishing media which shall not be used for safety reasons

- None.

### 5.3. Special exposure hazards in a fire

- The product is not flammable.
- Not combustible.
- Heating can release hazardous gases.
- Gives off hydrogen by reaction with metals.

### 5.4. Hazardous decomposition products

- Hydrogen
- Hydrogen fluoride

### 5.5. Special protective equipment for firefighters

- Wear self-contained breathing apparatus and protective suit.
- Fire fighters must wear fire resistant personnel protective equipment.
- Wear chemical resistant oversuit
- Protect intervention team with a water spray as they approach the fire.

### 5.6. Other information

- Cool containers / tanks with water spray.
- Approach from upwind.
- Suppress (knock down) gases/vapours/mists with a water spray jet.
- After the fire, proceed rapidly with cleaning of surfaces exposed to the fumes in order to limit equipment damage.

## 6. ACCIDENTAL RELEASE MEASURES

### 6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. Advice for non-emergency personnel

- Prevent further leakage or spillage if safe to do so.

6.1.2. Advice for emergency responders

- Approach from upwind.
- Isolate the area.
- Wear self-contained breathing apparatus in confined spaces, in cases where the oxygen level is depleted, or in case of significant emissions.
- Suppress (knock down) gases/vapours/mists with a water spray jet.
- Avoid spraying the leak source.
- Ventilate the area.

### 6.2. Environmental precautions

- If the product contaminates rivers and lakes or drains inform respective authorities.
- Should not be released into the environment.

### 6.3. Methods and materials for containment and cleaning up

- Dam up.
- Soak up with inert absorbent material.
- Prevent product from entering drains.
- Dilute with water.
- Contact with water may produce heat release and presents risks of splashing.
- When diluting, always add the product to water. Never add water to the product.
- Neutralise with the following product(s):
- soda ash
- lime
- Keep in properly labelled containers.
- Keep in suitable, closed containers for disposal.

## 7. HANDLING AND STORAGE

### 7.1. Handling

- Used in closed system
- Handle small quantities under a lab hood.
- Use only in well-ventilated areas.
- Use only equipment and materials which are compatible with the product.
- Keep away from Incompatible products.
- Preferably transfer by pump or gravity.
- For further information, please contact:
- Manufacturer, importer, supplier

### 7.2. Storage

- Keep container tightly closed.
- Keep in a cool, well-ventilated place.
- Keep away from heat.
- Keep away from Incompatible products.
- Keep in a bunded area.
- Information about special precautions needed for bulk handling is available on request.

### 7.3. Other information

- Provide tight electrical equipment well protected against corrosion.
- For personal protection see section 8.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### 8.1. Exposure Limit Values

**Hydrogen fluoride**

- PEL (OSHA / USA)
  TWA = 3 ppm
- US. ACGIH Threshold Limit Values 12 2010
  time weighted average = 0.5 ppm
- US. ACGIH Threshold Limit Values 12 2010
  Ceiling Limit Value = 2 ppm
- US. OSHA Table Z-2 (29 CFR 1910.1000) 02 2006
  time weighted average = 3 ppm
- US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) 02 2006
  Permissible exposure limit = 2.5 mg/m3
  Remarks: as F
- US. OSHA Table Z-1-A (29 CFR 1910.1000) 1989
  time weighted average = 3 ppm
  Remarks: as F
- US. OSHA Table Z-1-A (29 CFR 1910.1000) 1989
  Short term exposure limit = 6 ppm
  Remarks: as F
- US. ACGIH Threshold Limit Values 12 2010
  Remarks: as F, Can be absorbed through skin.
- US. Tennessee. OELs. Occupational Exposure Limits, Table Z1A 06 2008
  time weighted average = 3 ppm
  Remarks: as F
- US. Tennessee. OELs. Occupational Exposure Limits, Table Z1A 06 2008
  Short term exposure limit = 6 ppm
  Remarks: as F

**Hexafluorosilicic acid**

- US. ACGIH Threshold Limit Values 2009
  time weighted average = 2.5 mg/m3
  Remarks: as F
- US. OSHA Table Z-2 (29 CFR 1910.1000) 02 2006
  time weighted average = 2.5 mg/m3
  Remarks: Dust
- US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) 02 2006
  Permissible exposure limit = 2.5 mg/m3
  Remarks: as F
- US. OSHA Table Z-1-A (29 CFR 1910.1000) 1989
  time weighted average = 2.5 mg/m3
  Remarks: as F
- US. Tennessee. OELs. Occupational Exposure Limits, Table Z1A 06 2008
  time weighted average = 2.5 mg/m3
  Remarks: as F

ACGIH® and TLV® are registered trademarks of the American Conference of Governmental Industrial Hygienists.
SAEL = Solvay Acceptable Exposure Limit, Time Weighted Average for 8 hour workdays. No Specific TLV STEL (Short Term Exposure Level) has been set. Excursions in exposure level may exceed 3 times the TLV TWA for no more than a total of 30 minutes during a workday and under no circumstances should they exceed 5 times the TLV TWA.

### 8.2. Engineering controls

- Provide appropriate exhaust ventilation at machinery.
- Apply technical measures to comply with the occupational exposure limits.

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

### 8.3. Personal protective equipment

#### *8.3.1. Respiratory protection*

- In the case of dust or aerosol formation use respirator with an approved filter.
- Self-contained breathing apparatus in confined spaces/insufficient oxygen/in case of large uncontrolled emissions/in all circumstances when the mask and cartridge do not give adequate protection.
- Use only respiratory protection that conforms to international/ national standards.
- Use NIOSH approved respiratory protection.
- Respirator with a full face mask
- Use respirator when performing operations involving potential exposure to vapour of the product.

#### *8.3.2. Hand protection*

- Take note of the information given by the producer concerning permeability and break through times, and of special workplace conditions (mechanical strain, duration of contact).
- Protective gloves - impervious chemical resistant:
- Suitable material: butyl-rubber

#### *8.3.3. Eye protection*

- Face-shield
- Chemical resistant goggles must be worn.

#### *8.3.4. Skin and body protection*

- Chemical resistant apron
- If splashes are likely to occur, wear:
- butyl-rubber
- Boots
- Do not wear leather shoes.

#### *8.3.5. Hygiene measures*

- Take off contaminated clothing and shoes immediately.
- Wash contaminated clothing before re-use.
- Handle in accordance with good industrial hygiene and safety practice.
- Ensure that eyewash stations and safety showers are close to the workstation location.
- Prohibit contact with any leather object

## 9. PHYSICAL AND CHEMICAL PROPERTIES

### 9.1. General Information

| | | |
|---|---|---|
| **Appearance** | : | liquid |
| **Colour** | : | colourless |
| **Odour** | : | pungent |

### 9.2. Important health safety and environmental information

| | | |
|---|---|---|
| **pH** | : | 1<br>*Concentration*: 100 g/l |
| **Boiling point/boiling range** | : | 105 °C ( 221 °F ) |
| **Flash point** | : | *Remarks*: not applicable |
| **Flammability** | : | *Remarks*: The product is not flammable. |
| **Explosive properties** | : | *Explosion danger*:<br>*Remarks*: With certain materials (see section 10). |

| | | |
|---|---|---|
| **Oxidizing properties** | : | *Remarks*: not applicable |
| **Vapour pressure** | : | 30 hPa<br>*Temperature*: 20 °C ( 68 °F ) |
| **Relative density / Density** | : | 1.23<br>*Temperature*: 15.6 °C ( 60.1 °F ) |
| **Solubility(ies)** | : | Water<br>*Remarks*: completely miscible |
| **Partition coefficient: n-octanol/water** | : | *Remarks*: not applicable |
| **Vapour density** | : | > 1<br>*Temperature*: 20 °C ( 68 °F ) |

### 9.3. Other data

| | | |
|---|---|---|
| **Freezing point:** | : | < -2 °C ( 28 °F ) |
| **Decomposition temperature** | : | 105 °C ( 221 °F ) |

## 10. STABILITY AND REACTIVITY

### 10.1. Stability

- Stable under recommended storage conditions.
- Corrosive in contact with metals
- Gives off hydrogen by reaction with metals.
- Risk of violent reaction.
- Risk of explosion.

### 10.2. Conditions to avoid

- To avoid thermal decomposition, do not overheat.
- Keep at temperature not exceeding: 105 °C ( 221 °F )

### 10.3. Materials to avoid

- glass, Strong oxidizing agents, Metals

### 10.4. Hazardous decomposition products

- Hydrogen, Hydrogen fluoride

## 11. TOXICOLOGICAL INFORMATION

### Toxicological data

***Acute oral toxicity***

- LD 100, guinea pig, 80 mg/kg (2 % solution)

***Acute inhalation toxicity***

- LC50, 1 h, rat, 850 - 1,070 mg/m3

***Irritation (other route)***

- Corrosive

***Chronic toxicity***

- Inhalation, Prolonged exposure, rat, Target Organs**:** Respiratory system, Kidney, Liver, testes, observed effect, (hydrofluoric acid)

- Inhalation, Prolonged exposure, rat, Target Organs**:** cardio-vascular system, nervous system, observed effect, (hydrofluoric acid)

***Remarks***

- corrosive effects
- Liver and kidney injuries may occur.
- Chronic exposure may entail dental or skeletal fluorosis
- The product causes burns of eyes, skin and mucous membranes.
- Risk of cardiac and nervous disorders.
- The seriousness of the lesions and the prognosis of intoxication depend directly on the concentration and duration of exposure.
- Chronic exposure (to the product) at high concentrations can cause bone fluorosis.

## 12. ECOLOGICAL INFORMATION

### 12.1. Ecotoxicity effects

***Acute toxicity***

- Fishes, Salmo gairdneri, LC50, 96 h, 51 mg/l (Fluorides)
- Crustaceans, Mysidopsis, EC50, 96 h, 10.5 mg/l (Fluorides)
  Remarks: salt water
- Crustaceans, Daphnia magna, EC50, 48 h, 97 mg/l (Fluorides)
  Remarks: fresh water

***Chronic toxicity***

- Fishes, Salmo gairdneri, LC50, 21 Days, 2.7 - 4.7 mg/l (Fluorides)
- Crustaceans, Daphnia magna, NOEC, 21 Days, 3.7 mg/l (Fluorides)
- Algae, Scenedesmus sp., EC50, 96 h, 43 mg/l (Fluorides)

### 12.2. Mobility

- Air
  Remarks: mobility as solid aerosols
- Water, Solubility(ies), Mobility
- Soil/sediments, (fluoride)
  Conditions: pH
  Remarks: potential adsorption

### 12.3. Persistence and degradability

***Abiotic degradation***

- Air
  Result: neutralization by natural alkalinity
- Water, Soil
  Result: ionization/neutralization
- Water, Soil
  Result: complexation/precipitation of inorganic materials

***Biodegradation***

- Remarks: The methods for determining the biological degradability are not applicable to inorganic substances.

### 12.4. Bioaccumulative potential

- Bioaccumulative potential: log Pow
  Result: not applicable
- (Fluorides)
  Result: accumulation into vegetable leafs

### 12.5. Other adverse effects

- no data available

**12.6. Remarks**

- No data is available on the product itself.
- Ecological data therefore refers only to the effects of the decomposition products.
- Harmful to aquatic organisms.
- Nevertheless, hazard for the environment is limited due to product properties:
- . low chronic toxicity.
- Product fate is highly dependent on environmental conditions: pH, temperature, redox potential, mineral and organic content of the medium,...

## 13. DISPOSAL CONSIDERATIONS

**13.1. Waste from residues / unused products**

- In accordance with local and national regulations.
- Refer to manufacturer/supplier for information on recovery/recycling.

**13.2. Packaging treatment**

- Clean container with water.
- The empty and clean containers are to be reused in conformity with regulations.
- To avoid treatments, as far as possible, use dedicated containers.

**13.3. RCRA Hazardous Waste**

- Listed RCRA Hazardous Waste (40 CFR 302) - No
- Unlisted RCRA Hazardous Waste (40 CFR 302) - Yes
- D002 (corrosive waste)

## 14. TRANSPORT INFORMATION

**IATA-DGR**

| | |
|---|---|
| UN number | UN 1778 |
| Class | 8 |
| Packing group | II |
| ICAO-Labels | 8 - Corrosive |
| Proper shipping name: Fluorosilicic Acid | |

**IMDG**

| | |
|---|---|
| UN number | UN 1778 |
| Class | 8 |
| Packing group | II |
| IMDG-Labels | 8 - Corrosive |
| EmS | F-A<br>S-B |
| Proper shipping name: Fluorosilicic Acid | |

**U.S. Dept of Transportation**

| | |
|---|---|
| UN number | UN 1778 |
| Class | 8 |
| Packing group | II |
| Label | 8 - Corrosive |
| EmS | 154 |

Proper shipping name: Fluorosilicic Acid

**Canada (TDG)**

| | |
|---|---|
| UN number | UN 1778 |
| Class | 8 |
| Packing group | II |
| Label | 8 - Corrosive |
| EmS | 154 |
| Proper shipping name: Fluorosilicic Acid | |

**Mexico (NOM-002-SCT)**

| | |
|---|---|
| UN number | UN 1778 |
| Class | 8 |
| Packing group | II |
| Label | 8 - Corrosive |

## 15. REGULATORY INFORMATION

### 15.1. Inventory Information

| | | |
|---|---|---|
| **Australian Inventory of Chemical Substances (AICS)** | : - | In compliance with inventory. |
| **Canadian Domestic Substances List (DSL)** | : - | In compliance with inventory. |
| **Inventory of Existing Chemical Substances (China) (IECS)** | : - | In compliance with inventory. |
| **Japan (ENCS) List (ENCS (JP))** | : - | In compliance with inventory. |
| **New Zealand Interim Inventory of Chems. (NZ CLSC)** | : - | In compliance with inventory. |
| **Toxic Substance Control Act list (TSCA)** | : - | In compliance with inventory. |
| **EU list of existing chemical substances (EINECS)** | : - | In compliance with inventory. |
| **Korean Existing Chemicals Inventory (KECI (KR))** | : - | In compliance with inventory. |
| **Philippines PICCS (PICCS (PH))** | : - | In compliance with inventory. |

### 15.2. Other regulations

***US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 302 Extremely Hazardous Substance (40 CFR 355, Appendix A)***

- not regulated.

***US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 313 Toxic Chemicals (40 CFR 372.65) - Supplier Notification Required***

- not regulated.

***US. EPA CERCLA Hazardous Substances (40 CFR 302)***

- not regulated.

***US. New Jersey Worker and Community Right-to-Know Act (New Jersey Statute Annotated Section 34:5A-5)***

- yes.

***US. Pennsylvania Worker and Community Right-to-Know Law (34 Pa. Code Chap. 301-323)***

- yes.

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

- not regulated.

## 16. OTHER INFORMATION

**Ratings :**

**NFPA (National Fire Protection Association)**
Health = 3 Flammability = 0 Instability = 1 Special =None

**HMIS (Hazardous Material Information System)**
Health = 3 Fire = 0 Reactivity = 1 PPE : Supplied by User; dependent on local conditions

**Further information**

- HF-Antidote Gel from IPS Healthcare is recommended as treatment for injuries from hydrofluoric acid.
- Update
  This data sheet contains changes from the previous version in section(s): 1.1, 1.4
- Distribute new edition to clients

Material Safety Data Sheets contain country specific regulatory information; therefore, the MSDS's provided are for use only by customers of the company mentioned in section 1 in North America. If you are located in a country other than Canada, Mexico or the United States, please contact the Solvay Group company in your country for MSDS information applicable to your location.

The previous information is based upon our current knowledge and experience of our product and is not exhaustive. It applies to the product as defined by the specifications. In case of combinations or mixtures, one must confirm that no new hazards are likely to exist. In any case, the user is not exempt from observing all legal, administrative and regulatory procedures relating to the product, personal hygiene, and integrity of the work environment. (Unless noted to the contrary, the technical information applies only to pure product).

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