

# Extended SAFETY DATA SHEET

## Hexafluorosilicic Acid

This Safety Data Sheet contains information concerning the potential risks to those involved in handling, transporting and working with the material, as well as describing potential risks to the consumer and the environment. This information must be made available to those who may come into contact with the material or are responsible for the use of the material. This Safety Data Sheet is prepared in accordance with formatting described in the CLP Regulation (EC) No 1272/2008.

### Section 1. Identification of the substance/mixture and of the company/undertaking

#### 1.1 Product identifier

Chemical Name: Fluorosilicic Acid  
CAS Number: 16961-83-4  
EINECS Number: 241-034-8  
REACH Registration No.: **01-2119488906-19-0000**  
Chemical Constituent: Monoconstituent inorganic  
Name of the preparation / mixture: Hexafluorosilicic acid, solution 20-22%  
ID No in Appendix VI / CLP Regulation: 009-011-00-5

#### 1.2 Relevant identified uses of the substances or mixture and of the company/undertaking

Used in mixing, preparation and repackaging, as an intermediate in the synthesis of chemicals, as a processing aid and in cleaning and disinfection. It is also used in fluoridation in water treatment, metal surface treatment, and manufacture of basic metals, mineral acidification, professional cleaning and disinfection and as a laboratory chemical.

#### 1.3 Details of the supplier of the safety data sheet

Company name: AGROPOLYCHIM JSCo  
Address: BULGARIA,  
9160 DEVNYA  
INDUSTRIAL ZONE  
URL address: [www.agropolychim.bg](http://www.agropolychim.bg)  
Contact person for eSDS:  
Miroslava Tsvetkova, dipl. Eng.  
e-mail: [vasileva@agropolychim.bg](mailto:vasileva@agropolychim.bg)  
tel: +359 / 519 97 419, fax: +359 / 519 933 63

#### 1.4 Emergency telephone numbers

Country	Contact Number	Specific Information
Bulgaria – Medical Institute Pirogov, Toxicology Clinique	+359 2 9154 409	7 days/week, 24 hours/day
At the company site	+359 519 97 530	7 days/week, 24 hours/day

## Section 2. Hazards Identification

### 2.1 Classification of the substance

<b>Classification under Regulation (EC) No. 1272/2008:</b>	Skin Corr. 1B H314.
--	---------------------

**Physicochemical hazards:** No physico chemical hazards are expected.

**Human health hazards:** Acutely toxic following dermal and inhalation exposure. Causes severe burns when applied to human skin. Inhalation exposure results in burning of the eyes and numbness of the lips. Following prolonged exposure, skeletal fluorosis and urinary fluoride excretion was observed in humans. No mutagenic activity is expected. There is no evidence of carcinogenicity following exposure. No adverse reproductive effects are likely to occur following exposure.

**Environment hazards:** Emission of Hexafluorosilicic Acid directly to municipal sewage treatment plants should be avoided as with all acids and fluoride compounds. Potential effects in the environment are alteration of pH and toxicity due to fluoride exposure.

Please see Section 16 for full text of each classification.

### 2.2 Label elements

**Regulation (EC) No 1272/2008:**



**Signal word**

Danger

#### Hazard Statements

H314 Causes severe skin burns and eye damage

#### Precautionary statements:

P260 Do not breathe dust/fumes/gas/mist/vapours/sprays.  
 P301+P330+P331 IF SWALLOWED: rinse mouth. Do not induce vomiting.  
 P303+P361+P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.  
 P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.  
 P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
 P405 Store locked up.

## 2.3 Other hazards

<b>PBT:</b>	Not considered to be a PBT
-------------	----------------------------

## Section 3. Composition

Chemical name / formula	CAS Number	EINECS Number	Typical content on a dry basis	Classification according Regulation (EC) No. 1272/2008
Hexafluorosilicic Acid, H <sub>2</sub> SiF <sub>6</sub>	16961-83-4	241-034-8	95.29 %	H314 Skin Corr. 1B.
Hydrogen fluoride, HF	7664-39-3	231-634-8	3,51 %	Skin Corr. 1B; H314: 1% ≤ C < 7%
Orthophosphoric acid, H <sub>3</sub> PO <sub>4</sub>	7664-38-2	231-633-2	1.20 %	Skin Irrit. 2; H315: 10% ≤ C < 25% Skin Corr. 1B; H314: C ≥ 25% Eye Irrit. 2; H319: 10% ≤ C < 25%

See section 16 for full description of the text of each classification.

## Section 4. First Aid Measures

### 4.1 Description of first aid measures

#### Inhalation

Fresh air, rest. Half-upright position. Refer for medical attention.

#### Skin contact

Remove contaminated clothes. Rinse skin with plenty of water or shower. Immediately refer for medical attention. Massaging calcium gluconate or treatment with calcium carbonate into the affected area is recommended treatment.

#### Accidental eye contact

First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then consult a doctor. Rinse the eyes with a calcium gluconate 1% solution in physiological serum (10 ml of calcium gluconate 10% in 90 ml of physiological serum).

#### Ingestion

Rinse mouth. Do not induce vomiting. Give plenty of water to drink. Refer for medical attention. Treatment with calcium carbonate and calcium gluconate is recommended.

### 4.2 Most important symptoms and effects, both acute and delayed

Burning of the eyes and numbness of the lips may occur following inhalation exposure, with symptoms appearing up to 24 hours after exposure. Skeletal fluorosis may also occur following chronic exposure.

#### **4.3 Indication of any immediate attention and special treatment needed.**

Treatment with calcium gluconate or calcium carbonate is recommended.

### **Section 5. Firefighting Measures**

---

#### **5.1 Extinguishing media**

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Suitable media may include water spray, dry chemical, fog or foam.

#### **5.2 Special hazards arising from the substance or mixture**

When heated to decomposition (1050 deg C), it emits highly toxic and corrosive fumes of Hydrogen Fluoride, Silicon Tetrafluoride and Hydrogen gas.

#### **5.3 Advice for fire-fighters**

Wear self-contained breathing apparatus and protective suit. Fire fighters must wear fire resistant personnel protective equipment. Wear chemical resistant oversuit.

### **Section 6. Accidental Release Measures**

---

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

Large Spills: Level A clothing (full encapsulating suit with self-contained breathing apparatus). Do not attempt to take action without suitable protective clothing - see section 8 of SDS.

Small Spills: Impervious clothing and rubber gloves should be used for small spills.

#### **6.2 Environmental precautions**

Do not allow any release to waterways, watercourses, drains and municipal sewers. If the product contaminates rivers and lakes, inform respective authorities.

#### **6.3 Method for cleaning up**

Collect leaking and spilled liquid in sealable iron containers as far as possible. Absorb remaining liquid in sand or inert absorbent and remove to safe place. Keep in properly labelled containers. Keep in suitable, closed containers for disposal.

#### **6.4 Reference to other sections**

Refer to section 8 of SDS for personal protection details.

### **Section 7. Handling and Storage**

---

#### **7.1 Precautions for safe handling**

Tanks should be vented and fitted with an overflow pipe. Tanks should be banded to contain spillage. For smaller packages double skinned HDPE plastic containers are acceptable. Submerged loading should be preferred to avoid splashing.

### 7.2 Condition for safe storage, including any incompatibilities

Store in a cool, dry, well ventilated area away from sources of ignition. Do not store in glass or stoneware. Bulk quantities should be stored in plastic (uPVC, Polypropylene or Polythene) or rubber - lined tanks.

### 7.3 Specific end use(s)

No further details

## Section 8. Exposure Controls/Personal Protection

### 8.1 Control parameters

Hexafluorosilicic Acid: 95%

Hydrogen fluoride: 3.0%

DNEL/DMEL			Exposure route	Exposure frequency	Critical component	Remark
Worker		Consumer				
Industry	Professional					
Not applicable	Not applicable	0.01 mg/kg bw/day	oral	short term (acute)	Systemic toxicity from repeated dose toxicity Systemic toxicity from repeated dose toxicity	
Not applicable	Not applicable	0.01 mg/kg bw/day		long term (repeated)		
<b>Not quantifiable due to corrosive properties</b>			dermal	short term (acute) long term (repeated)		
<b>Not quantifiable due to corrosive properties</b>					Local effects from respiratory tract irritation. Systemic effects from repeated dose toxicity	
3.125 mg/m <sup>3</sup>	3.125 mg/m <sup>3</sup>	1.56 mg/m <sup>3</sup>	inhalation	short term (acute)		
Not derived	Not derived	0.04 mg/m <sup>3</sup>	inhalation	short term (acute)		
Not derived	Not derived	1.56 mg/m <sup>3</sup>		long term (repeated)	Local effects from respiratory tract irritation.	

1.88 mg/m <sup>3</sup>	1.88 mg/m <sup>3</sup>	0.04 mg/m <sup>3</sup>	long term (repeated)	Systemic toxicity from repeated dose toxicity
------------------------	------------------------	------------------------	----------------------	---

Workplace exposure limits:

Hydrogen Fluoride:

UK – TWA (8 hour reference period): 1.5 mg/m<sup>3</sup>.

UK – 15 minute STEL: 2.5 mg/m<sup>3</sup>.

PNEC (freshwater): 0.9 mg/L.

PNEC (soil): 11 mg/kg.

PNEC (STP): 51 mg/L.

## 8.2 Exposure controls

Ensure there is exhaust ventilation of the area. Facilities are housed outdoors and not close to buildings. The integrity of the enclosed processes are fully monitored. Ensure that primary emission sources are not located in the breathing zone of the worker.

### Respiratory protection

Wear EU approved self-contained acid suit and/or approved respirator.

### Hand protection

Protective anti-acid gloves.

### Eye protection

Face shield or eye protection in combination with breathing protection.

### Skin protection

Chemical resistant, anti-acid protective clothing.

## Section 9. Physical and Chemical Properties

### 9.1 Information on basic physical and chemical properties

<b>Appearance:</b>	Colourless liquid.
<b>Odour:</b>	Pungent
<b>Odour threshold:</b>	n.a.
<b>pH:</b>	n.a.
<b>Melting point/freezing point °C:</b>	19°C
<b>Initial boiling point and boiling range °C:</b>	n.a.
<b>Flash point:</b>	n.a.
<b>Evaporation rate:</b>	n.a.

<b>Flammability</b>	Not flammable.
<b>Vapour pressure:</b>	2300 Pa at 293K.
<b>Vapour density</b>	n.a.
<b>Relative density:</b>	1.0407 -1.2742 g/cm <sup>3</sup> for solutions of 5 -30% and 1.4634 at 25 degrees Celsius for a solution of 60.97%.
<b>Solubility:</b>	Miscible with water.
<b>Partition Coefficient: n-octanol/water:</b>	n.a. as substance is inorganic.
<b>Auto-ignition temperature:</b>	n.a. as substance is inorganic.
<b>Decomposition temperature:</b>	n.a.
<b>Viscosity:</b>	6.5 Pas
<b>Explosive properties:</b>	Not explosive.
<b>Oxidising properties:</b>	Non-oxidising.

## 9.2 Other information

No further details

## Section 10. Stability and Reactivity

### 10.1 Reactivity

Reacts with many metals to produce flammable and explosive hydrogen gas. Keep containers cool with water, using spray nozzles.

### 10.2 Chemical stability

Stable under normal conditions of use.

### 10.3 Possibility of hazardous reactions

Possibility of hazardous reactions occurring at decomposition.

### 10.4 Conditions to avoid

Incompatibles

### 10.5 Incompatible materials

Metals, glass, stoneware

### 10.6 Hazardous decomposition products

Decomposition will occur at temperatures above 1050 degrees C and will produce toxic and corrosive fumes.

## Section 11. Toxicological Information

### 11.1 Information on toxicological effects

**Acute Toxicity:** Acute toxicity will be dominated by local (site of contact) irritant and corrosive effects. Causes severe burns when tested on human skin.

	<b>Effect dose</b>	<b>Species</b>	<b>Method</b>	<b>Remark</b>
Acute oral toxicity	LD50 430 mg/kg bw.	Rats	n.a.	Reliability of the study could not be assessed and is therefore not deemed suitable for classification.

**Irritation:** Not examined as substance is corrosive.

**Corrosivity:** Corrosive to skin and eye.

**Sensitisation:** Not sensitising.

**Repeated dose toxicity:** No studies have been performed with HFS acid, however comprehensive data are available for sodium fluoride. The repeated dose oral toxicity of HFS acid will be due to fluoride, therefore read-across from the comprehensive NTP dataset with the soluble salt NaF is appropriate. Effects of repeated fluoride exposure in experimental animals were seen on the teeth, bones, respiratory tract and kidney. Evidence from epidemiological studies in humans also indicate that prolonged exposure to fluoride causes dental and skeletal effects. Following prolonged inhalation exposure, increased bone densities and a urinary fluoride excretion rate ranging from 1.0 – 9.6 mg/L were reported in an epidemiological study.

**Carcinogenicity:** Not carcinogenic based on NTP studies in the rat and mice are available for sodium fluoride.

**Mutagenicity:** Following *in vitro* bacterial reverse mutation assay, negative results were observed. An *in vitro* cell gene mutation assay resulted in cytotoxicity but not mutagenicity while a second cell gene mutation assay indicated positive results in mouse lymphoma cells. Ambiguous results were obtained in an *in vitro* mammalian chromosome aberration test in Chinese Hamster Ovary cells. In an *in vivo* somatic mutation assay in *Drosophila*, negative results were obtained. In an *in vivo* *Drosophila* SLRL test and the *Drosophila* recessive lethal test, ambiguous results were obtained. An *in vivo* micronucleus assay and a combined chromosomal aberration and micronucleus assay indicated a negative result. Therefore, the available data indicate that fluoride does not interact directly with DNA and is not genotoxic when administered via an appropriate route (i. e. by oral or inhalation exposure). HFS acid is not predicted to be genotoxic.

**Toxicity for reproduction:** No indication of reprotoxicity.

**Route of exposure:** Inhalation and Dermal.

**Symptoms related to the physical, chemical and toxicological characteristics:**  
Corrosive to the eyes and skin. Chronic exposure may lead to dental or skeletal fluorosis.

## Section 12. Ecological Information

### 12.1 Toxicity

Toxic to aquatic organisms.



Aquatic toxicity	Effect dose	Exposure time	Species	Method	Evaluation	Remark
Acute fish toxicity	LC50	96 h	<i>Lepomis macrochirus</i>	Screening study of acute fish toxicity	50 mg/L	
Acute daphnia toxicity	EC50	96 h	<i>Daphnia magna</i>	No guideline stated	26 – 48 mg/L	Result based on concentration of the fluoride ion.
Acute algae toxicity	EC50	96 h	<i>various algae species</i>	No guideline stated	43 mg/L	Result based on biomass using sodium fluoride.
Chronic fish toxicity	NOEC	21 days	<i>Oncorhynchus mykiss</i>	No guideline stated	4 mg/L	Result based on mortality
Chronic daphnia toxicity	NOEC	21 days	<i>Daphnia magna</i>	No specific guideline stated.	3.7 mg/L	Result based on reproductive effects observed following nominal concentration.

## 12.2 Persistence and degradability

Not considered to be persistent or biodegradable. The substance is inorganic and will hydrolyse and dissociate under environmental conditions to form fluoride and silicate ions. No biodegradation of the substance or these ions will occur.

## 12.3 Bioaccumulative potential

The calculated BCF is between <2 and >58 L/kg wet weight, which is below the threshold of 2000, indicating Hexafluorosilicic acid does not satisfy the criterion for classification as bioaccumulative.

## 12.4 Mobility in soil

Fluoride is the predominant ion in soil above pH of 6. Below pH 5.5, adsorption is low as fluoride exists as complexes. Above pH 5.5, adsorption is lower due to reduced electrostatic potential. The occurrence of precipitation of fluoride ions at higher concentrations reduces the concentration of free fluoride in calcareous soils. Fluoride is extremely immobile in soil as a result of precipitation and adsorption, with leaching of 5% observed in soil with fluoride concentrations up to 80mg/dm<sup>3</sup>.

## 12.5 Results of PBT and vPvB assessment

This substance is not identified as a PBT substance

## 12.6 Other adverse effects

No further details

## Section 13. Disposal Considerations

### 13.1 Waste treatment methods

**Disposal operations** – Collect leaking and spilled liquid in sealable iron containers as far as possible. Absorb remaining liquid in sand or inert absorbent and remove to safe place.

**Disposal of packaging** – No specific information provided.

**Please follow all local, regional, national and international laws.**

#### **Section 14. Transport Information**

---

**14.1 UN number:** 1778

**14.2 UN proper shipping name:** Fluorosilicic acid

**14.3 Transport hazard class:** 8

**14.4 Packing group:** II

**IMDG – EmS code:** F-A, S-B

**14.5 Environmental hazards**

Environmentally Hazardous Substance

**14.6 Special precautions for user**

No information available

**14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**

Not applicable to packaged goods

#### **Section 15. Regulatory Information**

---

**15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**

No further information

**15.2 Chemical safety assessment**

A chemical safety assessment has been conducted.

#### **Section 16. Other Information**

---

**Other information**

**Hazard statements:**

H314 Causes severe skin burns and eye damage.

**Other hazards:**

Not considered to be PBT or vPvB

**Note:** The regulatory information given above only indicates the principal regulations specifically applicable to the product described in the safety data sheet. The user's attention is drawn to the possible existence of additional provisions which complete these regulations. Refer to all applicable national, international and local regulations or provisions.

Disclaimer: This sheet complements the technical sheets but does not replace them. The information given is based on our knowledge of the product, at the time of publication and is given in good faith. In addition, the attention of the user is drawn to the possible risk incurred by using the product for any other use than that for which it was intended.

In no way does this exempt the user from knowing and applying all the regulations controlling his activity. He alone will take on the responsibility for taking the precautions involved when using the product.

The aim of all the mandatory regulations mentioned is to help the user to fulfill his obligations regarding the use of hazardous products.

This information must not be considered exhaustive. It does not exempt the user from his responsibility to ensure that other obligations than those mentioned could apply relating to the storage and use of the product.