

MATERIAL SAFETY DATA SHEET**CC-4042****1. IDENTIFICATION OF THE PRODUCT AND THE COMPANY****Product Name:** *25% Fluorosilicic Acid Pure (CC-4042)***Revision Date:** September 02, 2015**Product Description:** *25% Fluorosilicic Acid Pure***Supplier:** **ControlChem Canada Limited**
4460 Harvester Road
Burlington, Ontario L7L 4X2
Tel: 905-319-2234 Fax: 905-319-0438**Emergency Numbers:**

1. **ControlChem Canada Ltd.** Emergency Number: 1-866-882-2436
2. In the event of an emergency involving Transportation of Dangerous Goods call **CANUTEC** at: 613-996-6666 or ***666 on a cellular phone.**
3. Call your local **Emergency Services**
4. Call your **Facility/Plant Management**

2. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS#	% RANGE	TLV	LD50 (mg/Kg)
Fluorosilicic Acid	16961-83-4	10-30	3 ppm TWA PEL	125 - 430 (oral, rat)
Hydrogen Fluoride	7664-39-3	less than 1.5	3 ppm TWA REL	Not available

3. HAZARDS IDENTIFICATION**Route of Entry:**

Skin Contact: Corrosive! Can cause corrosive skin injury, severe burns, blistering and permanent scarring.

Eye Contact: Corrosive! Can cause permanent eye damage, including blindness. High vapour concentrations are irritating.

Inhalation: Corrosive! Toxic! Product may cause severe irritation of the nose, throat and respiratory tract.

Ingestion: Corrosive! This product can cause severe burning in mouth, throat and abdomen.

4. FIRST AID MEASURES

FLUROSILICIC ACID IS CORROSIVE ON CONTACT AND POISONOUS BY INGESTION AND INHALATION OF ITS VAPOUR. FIRST AID ATTENTION MUST BE GIVEN URGENTLY AS POSSIBLE. ALL SUSPECTED FLUROSILICIC ACID BURNS SHOULD RECEIVE MEDICAL ATTENTION. TRAINING ON HANDLING FLUROSILICIC ACID INCIDENTS SHOULD BE PROVIDED BEFORE ANY FLUROSILICIC ACID HANDLING OR USE COMMENCES. BEFORE HANDLING, IT IS RECOMMENDED TO CHECK IF FIRST AID MEASURES ARE IN PLACE AT THE LOCAL HOSPITAL.

- Skin contact:*** Immediately and thoroughly flush affected area with copious amounts of cold water. Quickly and thoroughly wash acid off the affected areas. Continue washing until Calcium Gluconate gel is available for application. Apply calcium gluconate gel to affected area every 15 minutes until injured worker is transported to emergency facility or ambulatory care.
- Eye contact:*** Immediately and thoroughly flush eyes with water for at least 15 minutes. It is recommended to further flush eyes with a calcium gluconate containing fluid. Obtain medical attention immediately.
- Inhalation:*** Move victim to fresh air. Rest and keep warm. Give artificial respiration ONLY if breathing has stopped. Obtain medical attention immediately.
- Ingestion:*** Never give anything by mouth to an unconscious or convulsing person. Seek immediate medical attention! If vomiting occurs spontaneously, have victim lean forward with head down to avoid breathing in of vomitus. Do not induce vomiting. Give large quantities of milk or water and Tums or Milk of Magnesia. Take to hospital immediately.

5. FIRE-FIGHTING MEASURES

- Conditions of Flammability:*** None flammable. However, on contact with most metals, Fluorosilicic acid will liberate hydrogen gas, which is flammable and explosive.
- Suitable extinguishing media:*** Use media appropriate for surrounding fire and/or materials.
- Special fire-fighting precautions:*** Wear full protective equipment including a self-contained breathing apparatus.
- Flash Point (°C):*** Not available
- Auto Ignition Temperature (°C):*** Not available
- Flammable Limits in Air % by Volume:*** Not available
- Explosion Data:*** Decomposes above 105 degrees Celsius.
Above this temperature it will produce toxic and corrosive vapors of fluorides (hydrofluoric acid fumes). Fluorosilicic acid will liberate hydrogen gas on contact with most metals, which is flammable and explosive.

Sensitivity to Static Discharges: Not sensitive.

Hazardous Combustion Products: Thermal decomposition products are toxic and may include Hydrogen Fluoride, flammable hydrogen gas, silica tetrafluoride and irritating gases.

Special Protective precautions and equipment for fire fighters:

Wear full body protective clothing and breathing apparatus. Prevent spillage from entering drains or waterways. Consider evacuation. Use water to control fire and cool adjacent area and fire exposed Fluorosilicic acid storage containers. Do not approach Fluorosilicic acid containers suspected to be hot. If safe and practicable to do so, remove Fluorosilicic acid containers from path of fire. Equipment should be thoroughly decontaminated after use.

6. ACCIDENTAL RELEASE MEASURES

The hazardous nature of Fluorosilicic acid requires emergency and spill procedures to be effective to avoid both human and environmental exposure. Hazardous conditions may result if material is managed improperly. Make plans in advance to handle possible emergencies, such as obtaining a sufficient stock of absorbent material.

Personal precautions: Wear personal protective equipment as outlined in section 8.

Environmental precautions: Do not contaminate water.

Methods for cleaning up: Cleanup personnel will need personal protection equipment and respiratory protection. A portable safety shower and eyewash facilities may be needed for cleanup personnel. Bags of neutralizing agent or chemical absorbent and substantial amounts of water will be required for a large spill. A front end loader may be required to scoop up neutralized acid-lime/soda ash residue. A foam blanket may be required for a large spill.

For small spills wear respirator, protective clothing and gloves. Increase ventilation and allow fumes to vent to a safe area. Stay up wind of the spill. If possible contain the spill surface area by diking and adsorbing spill with sand, clay or vermiculite. Dilute spill and then neutralize with lime or soda ash to pH 6 to 10.

For large leaks use a water fog to dampen cloud of Fluorosilicic acid fumes and reduce vapours. If possible contain surface area of a spill by bunding with sand, clay or vermiculite. Use a foam blanket to cover Fluorosilicic acid to minimize evolution of acid fumes.

7. HANDLING AND STORAGE

Maximum Use: 6 mg/L

Handling:

Handle in accordance with good industrial hygiene and safety practices. Fluorosilicic acid is a regulated dangerous Class 8 corrosive. Proper protective clothing to be worn includes: acid resistant jacket, pants, gauntlet gloves, goggles, face shield, chemical resistant safety boots. A safety shower and eyewash should be available. Do not breathe vapour or mist. Avoid contact with skin, eyes and clothing. In a dilution process, do not add water to Fluorosilicic acid. Fluorosilicic acid should be added to dilution water.

Do not touch damaged containers or spilled materials unless wearing appropriated personal protective equipment.

Wash skin thoroughly with soap and water after handling.

Storage:

Keep in a cool, ventilated dry environment. Packaging material should not be made of metals, stoneware or glass. Confirm suitability of any material before using.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering controls:

Local exhaust ventilation required particularly at floor level.

Respiratory protection:

A NIOSH approved cartridge respirator with full-face shield. Chemical cartridge should provide protection against acid fumes (hydrogen fluoride). For air concentrations greater than 20 ppm, a NIOSH approved self-contained breathing apparatus with full-face shield should be used.

Eye protection:

Use chemical splash proof goggles and full face shield. Do not wear contact lenses.

Skin protection:

Wear acid proof overalls and/or jacket, pants, apron, rubber gloves and boots. Discard contaminated gloves after use.

Hygiene measures:

Wash hands before breaks and at the end of the workday. Handle in accordance with good industrial hygiene and safety practice.

Fluorosilicic Acid

OSHA PEL (TWA): 2.5 mg/m³ as F
NIOSH REL (TWA): 2.5 mg/m³ as F

Hydrofluoric Acid

NIOSH REL (TWA): 3 ppm
NIOSH REL (STEL): 6 ppm (as F; 15 min; Ceiling)

9. PHYSICAL AND CHEMICAL PROPERTIES

<i>Appearance/Odour:</i>	Water white to straw yellow, pungent odour
<i>Physical State:</i>	Liquid
<i>Odour Threshold:</i>	No data
<i>Specific Gravity:</i>	1.204-1.274
<i>pH:</i>	less than 2 @ (1 % solution)
<i>Solubility in Water:</i>	Complete
<i>Freezing Point (°C):</i>	No data
<i>Boiling Point (°C):</i>	Approx. 112°C
<i>Vapour Pressure (mmHg):</i>	No data
<i>Vapour Density (Air=1):</i>	No data
<i>Evaporation Rate:</i>	No data
<i>Coeff. Of Water/Oil:</i>	No data

10. STABILITY AND REACTIVITY

<i>Stability:</i>	Stable at ambient conditions.
<i>Materials to avoid:</i>	Avoid contact with strong oxidizers, acids, and alkalies, stoneware, glass, combustibles, strong bases, metals, peroxide, organic peroxides. Silica will dissolve in hydrofluoric acid to produce a corrosive gas, silicon tetrafluoride.
<i>Hazardous decomposition products:</i>	Thermal decomposition products are toxic and can include hydrogen fluoride, flammable hydrogen gas, silica tetrafluoride.

11. TOXICOLOGICAL INFORMATION**HEALTH EFFECTS:**

When handled in accordance with the guidelines Fluorosilicic acid should not present any health effects. If the product is mishandled, the following symptoms may develop:

Acute: Fluorosilicic acid is an acute irritant to the skin, eyes and mucous membranes and lungs. The acid and its vapours are moderately toxic. Fluoride effects may be delayed up to 24 hours, depending on fluoride ion concentration.

Inhalation: Fluorosilicic acid is a severe irritant to the respiratory tract. Over exposure at high levels may result in mucous membrane irritation of the nose and throat with coughing, shortness of breath and pulmonary edema (accumulation of fluid in the lungs). Asthma can also be aggravated by exposure to Fluorosilicic acid mists.

Skin: Fluorosilicic acid is a severe irritant to the skin. Prolonged contact may result in irritation, itching and possible skin rash.

Eye: Fluorosilicic acid is a severe irritant to the eyes. Contact may result in lacrimation, irritation, pain, redness and conjunctivitis. Prolonged contact may lead to corneal burns and possible permanent damage.

Swallowed: Severe irritant! Ingestion may cause burns of the intestinal tract leading to vomiting, acidosis, bloody diarrhea, wheezing, laryngitis, shortness of breath, headache and shock. Circulatory systems may be affected with symptoms of shock, rapid, weak or no pulse, severe hypotension and pulmonary changes with dyspnea and

emphysema. In some cases, necrosis and hemorrhage of the gastrointestinal tract, liver damage and death may occur. Scarring of gastrointestinal tract may occur in non-fatal cases.

Exposure Limits of Material

<i>LC 50 of Material, Species & Route:</i>	850 to 1070 ppm (1 hour inhalation, rat)
<i>LD 50 of Material, Species & Route:</i>	125-430 mg/kg (oral, rat)
<i>Carcinogenicity of Material:</i>	The ingredient of this product are not classed as carcinogenic by ACGIH, IARC, OSHA or NTP
<i>Reproductive Effects:</i>	Not available
<i>Irritancy of Material:</i>	See section 3 and 11
<i>Sensitizing Capability of Material:</i>	Not available
<i>Synergistic Materials:</i>	Not available

12. ECOLOGICAL INFORMATION

Fluorosilicic Acid:

LC50 96hr (Poecilia reticulata): 65 mg/L static.

LC50 96hr (Pimephales promelas): 28.7 mg/L static.

EC50 48hr (Daphnia magna) : 97 mg/L, (as fluoride), in fresh water conditions.

13. DISPOSAL CONSIDERATIONS

<i>Waste Disposal:</i>	Dispose of waste material and neutralized spill residue at an approved (hazardous) waste treatment/disposal facility in accordance with applicable local, provincial and federal regulations. Due to its inherent properties, hazardous conditions may result if material is managed improperly. Use hydrated lime (calcium hydroxide) or calcium carbonate to precipitate the fluoride ion in the form of calcium difluoride (CaF ₂).
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14. TRANSPORT INFORMATION

<i>T.D.G. Classification:</i>	Fluorosilicic Acid Class 8, UN1778, PK II
<i>Special Shipping Instructions:</i>	None

15. REGULATORY INFORMATION

WHMIS Classification:	E- Corrosive. D1A - Very Toxic Material Causing Immediate and Serious Toxic Effects . D2A - Very Toxic Material Causing Other Toxic Effects .
HMIS Ratings:	Health: 4 Flammability: 0, Reactivity: 1, Personal Protection: X

16. OTHER INFORMATION

Legend to abbreviations and acronyms used in the MSDS

ACGIH	American Conference of Governmental Industrial Hygienists
EC ₅₀	Environmental concentration 50 is the concentration of a material, in ppm or ppb, in the environment (usually water) a single dose of which is expected to cause a biological effect on 50% of a group of test animals.
ES-TWA	Exposure Standard – Time weighted average
ES-STEL	Exposure Standard – Short term exposure level.
ES-Peak	Exposure Standard – Peak level.
LC ₅₀	Lethal concentration 50, median lethal concentration.
LD ₅₀	The single dose of a substance that causes the death of 50% of an animal. population from exposure to the substance by any route other than inhalation.
OSHA	Occupational Safety and Health Administration .
PEL	Permissible Exposure Limit.
NIOSH	National Institute for Occupational Safety and Health
PPM	Parts per million
REL	Recommended Exposure Limit.
TWA EV	Time Weighted Average Exposure Value: The average airborne concentration of a biological or chemical agent to which a worker may be exposed in a work day or a work week.
%(wt/wt)	Percent amount on a weight per weight basis
%(wt/vol)	Percent amount on a weight per volume basis

Emergency Response Protocol: <http://www.workingatmcmaster.ca/med/document/RMM-309-Hydrogen-Fluoride-Emergency-Protocol-1-36.pdf>

Transport Canada Emergency Response Guide Number 154:

<http://www.wapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx/guide154/id912/mnid971>

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