



SAFETY DATA SHEET



FLUOROSILICIC ACID (22% Solution)

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

1.1 Product identifier

Product name FLUOROSILICIC ACID (22% SOLUTION)
Synonym(s) FSA • H₂SIF₆ • HEXAFLUOROSILICIC ACID • HYDROFLUOROSILICIC ACID • HYDROSILICOFLUORIC ACID

1.2 Uses and uses advised against

Use(s) FLUORIDATION • WATER TREATMENT

1.3 Details of the supplier of the product

Supplier name CSBP LIMITED
Address Kwinana Beach Road, Kwinana, WA, 6167, AUSTRALIA
Telephone (08) 9411 8777
Fax (08) 9411 8425
Website <http://www.csbp.com.au>

1.4 Emergency telephone number(s)

Emergency 1800 09 3333 (Australia); +61 8 9411 8444

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

GHS classification(s) Serious Eye Damage / Eye Irritation: Category 1
Skin Corrosion/Irritation: Category 1B
Acute Toxicity: Skin: Category 4
Acute Toxicity: Inhalation: Category 4
Specific Target Organ Systemic Toxicity (Single Exposure): Category 3
Acute Toxicity: Oral: Category 4

2.2 Label elements

Signal word DANGER

Pictogram(s)



Hazard statement(s)

H302 Harmful if swallowed.
H312 Harmful in contact with skin.
H314 Causes severe skin burns and eye damage.
H318 Causes serious eye damage.
H332 Harmful if inhaled.
H335 May cause respiratory irritation.

Prevention statement(s)

P260 Do not breathe dust/fume/gas/mist/vapours/spray.
P264 Wash thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P271 Use only outdoors or in a well-ventilated area.
P280 Wear protective gloves/protective clothing/eye protection/face protection.

PRODUCT NAME FLUOROSILICIC ACID (22% SOLUTION)**Response statement(s)**

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 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.
P310 Immediately call a POISON CENTER or doctor/physician.
P321 Specific treatment is advised - see first aid instructions.
P363 Wash contaminated clothing before reuse.

Storage statement(s)

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
P405 Store locked up.

Disposal statement(s)

P501 Dispose of contents/container in accordance with relevant regulations.

2.3 Other hazards

No information provided.

3. COMPOSITION/ INFORMATION ON INGREDIENTS

3.1 Substances / Mixtures

Ingredient	CAS Number	EC Number	Content
FLUOROSILICIC ACID	16961-83-4	241-034-8	22%
HYDROFLUORIC ACID	7664-39-3	231-634-8	0.5%
WATER	7732-18-5	231-791-2	Remainder

4. FIRST AID MEASURES

4.1 Description of first aid measures

Eye If in eyes, hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre, a doctor, or for at least 15 minutes. Where available, and after flushing for 15 minutes with water, flush affected eye with 1 % calcium gluconate fluid for 2 minutes. Supply, storage and maintenance of calcium gluconate needs to be under supervision of a registered nurse.

Inhalation If swallowed or inhaled, remove from contaminated area. Apply artificial respiration if not breathing. Do not give direct mouth-to-mouth resuscitation. To protect rescuer, use air-viva, oxy-viva or one-way mask. Resuscitate in a well-ventilated area.

Skin If skin contact occurs, immediately remove contaminated clothing. Flush skin under running water for 15 minutes. Then apply calcium gluconate gel. Contact a Poison Information Centre on 13 11 26 (Australia Wide). Apply 1 % calcium gluconate gel to affected area. If pain continues, re-apply the gel until pain ceases. Seek medical assistance immediately.

Ingestion For advice, contact a Poison Information Centre on 13 11 26 (Australia Wide) or a doctor (at once). If swallowed, do not induce vomiting.

First aid facilities No information provided.

4.2 Most important symptoms and effects, both acute and delayed

See Section 11 for more detailed information on health effects and symptoms.

4.3 Immediate medical attention and special treatment needed

OBTAIN IMMEDIATE MEDICAL ATTENTION and transfer to a medical facility required for specialist treatment.

5. FIRE FIGHTING MEASURES

5.1 Extinguishing media

Use an extinguishing agent suitable for the surrounding fire.

5.2 Special hazards arising from the substance or mixture

Non flammable. May evolve toxic gases (fluorides) when heated to decomposition. May evolve flammable hydrogen gas in contact with some metals.

PRODUCT NAME FLUOROSILICIC ACID (22% SOLUTION)

5.3 Advice for firefighters

Evacuate area and contact emergency services. Toxic gases may be evolved in a fire situation. Remain upwind and notify those downwind of hazard. Wear full protective equipment including Self Contained Breathing Apparatus (SCBA) when combating fire. Use waterfog to cool intact containers and nearby storage areas.

5.4 Hazchem code

2X
2 Fine Water Spray.
X Wear liquid-tight chemical protective clothing and breathing apparatus. Contain spill and run-off.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Wear Personal Protective Equipment (PPE) as detailed in section 8 of the SDS. Clear area of all unprotected personnel. Ventilate area where possible. Contact emergency services where appropriate.

6.2 Environmental precautions

Prevent product from entering drains and waterways.

6.3 Methods of cleaning up

Contain spillage, then cover / absorb spill with non-combustible absorbent material (vermiculite, sand, or similar), collect and place in suitable containers for disposal. Only trained personnel should undertake clean up.

6.4 Reference to other sections

See Sections 8 and 13 for exposure controls and disposal.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

7.2 Conditions for safe storage, including any incompatibilities

Store in a cool, dry, well ventilated area, removed from incompatible substances and foodstuffs. Ensure containers are adequately labelled, protected from physical damage and sealed when not in use. Check regularly for leaks or spills.

7.3 Specific end use(s)

No information provided.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

Exposure standards

Ingredient	Reference	TWA		STEL	
		ppm	mg/m ³	ppm	mg/m ³
Fluorides (as F)	SWA (AUS)	--	2.5	--	--
Hydrofluoric Acid	SWA (AUS)	3	2.6	--	--

Biological limits

Ingredient	Determinant	Sampling Time	BEI
FLUOROSILICIC ACID	Fluoride in urine	Prior to shift	2 mg/L
	Fluoride in urine	End of shift	3 mg/L

Reference: ACGIH Biological Exposure Indices

8.2 Exposure controls

Engineering controls

Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical extraction ventilation is required. Maintain vapour levels below the recommended exposure standard.

PRODUCT NAME FLUOROSILICIC ACID (22% SOLUTION)**PPE**

Eye / Face	Wear a faceshield.
Hands	Wear full-length butyl gloves.
Body	Wear impervious coveralls and PVC boots. When using large quantities or where heavy contamination is likely, wear a PVC apron.
Respiratory	Where an inhalation risk exists, wear an Air-line respirator or a Full-face Type B (Inorganic and Acid gas) respirator.



9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	CLOUDY GREY LIQUID
Odour	SLIGHT PUNGENT AND UNPLEASANT ODOUR
Flammability	NON FLAMMABLE
Flash point	NOT RELEVANT
Boiling point	105°C
Melting point	NOT AVAILABLE
Evaporation rate	NOT AVAILABLE
pH	< 1 (10 % solution)
Vapour density	NOT AVAILABLE
Specific gravity	1.18
Solubility (water)	SOLUBLE
Vapour pressure	24 mm Hg @ 25°C
Upper explosion limit	NOT RELEVANT
Lower explosion limit	NOT RELEVANT
Partition coefficient	NOT AVAILABLE
Autoignition temperature	NOT AVAILABLE
Decomposition temperature	NOT AVAILABLE
Viscosity	6.5 mPa·s @ 15.5°C
Explosive properties	NOT AVAILABLE
Oxidising properties	NOT AVAILABLE
Odour threshold	NOT AVAILABLE

10. STABILITY AND REACTIVITY

10.1 Reactivity

Carefully review all information provided in sections 10.2 to 10.6.

10.2 Chemical stability

Stable under recommended conditions of storage.

10.3 Possibility of hazardous reactions

Polymerization will not occur.

10.4 Conditions to avoid

Avoid heat, sparks, open flames and other ignition sources.

10.5 Incompatible materials

Incompatible with oxidising agents (e.g. hypochlorites), alkalis (e.g. sodium hydroxide) and metals. Also incompatible with combustible materials, acids (e.g. nitric acid) and combustible solids. The manufacturer reports that this product attacks glass.

10.6 Hazardous decomposition products

May evolve toxic gases (fluorides) when heated to decomposition.

11. TOXICOLOGICAL INFORMATION

PRODUCT NAME FLUOROSILICIC ACID (22% SOLUTION)

11.1 Information on toxicological effects

Health hazard summary	Highly corrosive. This product has the potential to cause serious adverse health effects. Use safe work practices to avoid eye or skin contact and inhalation. Over exposure may result in respiratory damage. Burning sensation may be delayed. Chronic exposure may result in bone (osteosclerosis, skeletal fluorosis) and ligament damage. The potential for adverse health effects may be reduced upon dilution. Evolves highly corrosive and toxic hydrofluoric acid.																				
Eye	Highly corrosive. Contact may result in irritation, lacrimation, pain, redness and corneal burns with possible permanent eye damage.																				
Inhalation	Corrosive - toxic. Over exposure may result in mucous membrane irritation of the respiratory tract, coughing and possible burns. High level exposure may result in ulceration of the respiratory tract, breathing difficulties, chemical pneumonitis and pulmonary oedema.																				
Skin	Corrosive. Contact may result in irritation, redness, pain, rash, dermatitis and possible burns. Effects may be delayed.																				
Ingestion	Highly corrosive - toxic. Ingestion may result in severe burns to the mouth and throat, vomiting, abdominal pain, ulceration of the gastrointestinal tract, convulsions and death.																				
Toxicity data	<table><tr><td colspan="2">FLUOROSILICIC ACID (16961-83-4)</td></tr><tr><td>LDLo (subcutaneous)</td><td>140 mg/kg (frog)</td></tr><tr><td colspan="2">HYDROFLUORIC ACID (7664-39-3)</td></tr><tr><td>LC50 (inhalation)</td><td>342 ppm/1 hour (mouse)</td></tr><tr><td>LCLo (inhalation)</td><td>50 ppm/30 minutes (human)</td></tr><tr><td>LDLo (intraperitoneal)</td><td>25 mg/m³ (rat)</td></tr><tr><td>LDLo (skin)</td><td>500 mg/kg (mouse)</td></tr><tr><td>LDLo (subcutaneous)</td><td>112 mg/m³ (frog)</td></tr><tr><td>TCLo (inhalation)</td><td>100 mg/m³/1 minute (man -eye, lung)</td></tr><tr><td>TDLo (ingestion)</td><td>143 mg/kg (rat)</td></tr></table>	FLUOROSILICIC ACID (16961-83-4)		LDLo (subcutaneous)	140 mg/kg (frog)	HYDROFLUORIC ACID (7664-39-3)		LC50 (inhalation)	342 ppm/1 hour (mouse)	LCLo (inhalation)	50 ppm/30 minutes (human)	LDLo (intraperitoneal)	25 mg/m ³ (rat)	LDLo (skin)	500 mg/kg (mouse)	LDLo (subcutaneous)	112 mg/m ³ (frog)	TCLo (inhalation)	100 mg/m ³ /1 minute (man -eye, lung)	TDLo (ingestion)	143 mg/kg (rat)
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12. ECOLOGICAL INFORMATION

12.1 Toxicity

Accidental spillage of fluorosilicic acid may suddenly reduce pH levels in an aquatic environment. No visible toxic effects have been observed on biological components such as plants and algae, although fluorosilicic acid is moderately toxic to molluscs and fish. However, hazard for the aquatic environment is limited due to fluorosilicic acid having low chronic properties. The acid is highly dependent on environmental conditions: pH, temperature, oxidoreductive potential, mineral and organic content of the medium.

Acute ecotoxicity:

Fish: 96 hr LC50 (*Salmo gairdneri*): 51 mg/L, (as fluoride);

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

Crustaceans: 96 hr EC50 (*Mysidopsis bahia*): 10.5 mg/L, (as fluoride), in salt water conditions;

Algae: 96 hr EC50 (*Scenedesmus* sp.): 43 mg/L, (as fluoride).

Chronic ecotoxicity:

Fish: 21 days LC50 (*Salmo gairdneri*): from 2.7 - 4.7 mg/L, (as fluoride);

Crustaceans: 21 days NOEC (*Daphnia magna*): 3.7 mg/L, (as fluoride).

12.2 Persistence and degradability

Abiotic:

- Air – neutralisation by natural alkalinity;
- Water/Soil – ionisation/neutralisation of inorganic and organic materials;
- Water/Soil – complexation/precipitation of inorganic materials.

Degradation product: aluminium/iron/calcium/phosphate complexes and /or precipitates, as a function of pH (fluorides).

Biotic; Not applicable as fluorosilicic acid is an inorganic compound.

12.3 Bioaccumulative potential

Fluorosilicic acid has potential for bioaccumulation as fluorides into vegetables.

12.4 Mobility in soil

- Air – mobility in aerosol form;
- Water – considerable solubility and mobility;
- Soil/Sediments – adsorption on minerals soil constituents – the proton occurring in clay may assist with neutralisation; may dissolve carbonate based materials; some material may remain for transport down towards the water table – on reaching the ground water table, the remnants of the acid may continue to move, in the direction of the ground water flow;
- Conditions: slightly acid pH (fluorides) - lime addition may be required to rectify low pH resulting from fluorosilicic acid spillages.

12.5 Other adverse effects

No information provided.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Waste disposal	Wearing the protective equipment detailed above, neutralise to pH 6-8 by SLOW addition to a saturated sodium bicarbonate solution or similar basic solution. Dilute with excess water and flush to drain. Waste disposal should only be undertaken in a well ventilated area.
Legislation	Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE



	LAND TRANSPORT (ADG)	SEA TRANSPORT (IMDG / IMO)	AIR TRANSPORT (IATA / ICAO)
14.1 UN Number	1778	1778	1778
14.2 Proper Shipping Name	FLUOROSILICIC ACID	FLUOROSILICIC ACID	FLUOROSILICIC ACID
14.3 Transport hazard class	8	8	8
14.4 Packing Group	II	II	II

14.5 Environmental hazards No information provided

14.6 Special precautions for user

Hazchem code	2X
GTEPG	8A4
EMS	F-A, S-B

15. REGULATORY INFORMATION

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

Poison schedule	Classified as a Schedule 6 (S6) Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP).	
Classifications	Safework Australia criteria is based on the Globally Harmonised System (GHS) of Classification and Labelling of Chemicals. The classifications and phrases listed below are based on the Approved Criteria for Classifying Hazardous Substances [NOHSC: 1008(2004)].	
Hazard codes	C Xi Xn	Corrosive Irritant Harmful
Risk phrases	R20/21/22 R34 R37 R41	Harmful by inhalation, in contact with skin and if swallowed. Causes burns. Irritating to respiratory system. Risk of serious damage to eyes.

PRODUCT NAME FLUOROSILICIC ACID (22% SOLUTION)

Safety phrases	S7/9	Keep container tightly closed and in a well ventilated place.
	S13	Keep away from food, drink and animal feeding stuffs.
	S21	When using, do not smoke.
	S23	Do not breathe gas/fumes/vapour/spray (where applicable).
	S24/25	Avoid contact with skin and eyes.
	S26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice
	S27	Take off immediately all contaminated clothing.
	S28	After contact with skin, wash immediately with plenty of water.
	S29	Do not empty into drains.
	S36/37/39	Wear suitable protective clothing, gloves and eye/face protection.
	S38	In case of insufficient ventilation, wear suitable respiratory equipment.
	S41	In case of fire and/or explosion, do not breathe fumes.
	S45	In case of accident or if you feel unwell seek medical advice immediately (show the label where possible).
	S46	If swallowed, contact a doctor or Poisons Information Centre immediately and show container or label.
	S50	Do not mix with incompatible materials.
	S51	Use only in well ventilated areas.
	S63	In case of accident by inhalation, remove casualty to fresh air and keep at rest.
Inventory listing(s)	AUSTRALIA: AICS (Australian Inventory of Chemical Substances)	
	All components are listed on AICS, or are exempt.	

16. OTHER INFORMATION

Additional information

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:

The recommendation for protective equipment contained within this report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

HEALTH EFFECTS FROM EXPOSURE:

It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a ChemAlert report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists
CAS #	Chemical Abstract Service number - used to uniquely identify chemical compounds
CNS	Central Nervous System
EC No.	EC No - European Community Number
GHS	Globally Harmonized System
IARC	International Agency for Research on Cancer
LC50	Lethal Concentration, 50% / Median Lethal Concentration
LD50	Lethal Dose, 50% / Median Lethal Dose
mg/m ³	Milligrams per Cubic Metre
OEL	Occupational Exposure Limit
pH	relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
ppm	Parts Per Million
STEL	Short-Term Exposure Limit
STOT-RE	Specific target organ toxicity (repeated exposure)
STOT-SE	Specific target organ toxicity (single exposure)
SUSMP	Standard for the Uniform Scheduling of Medicines and Poisons
SWA	Safe Work Australia
TLV	Threshold Limit Value
TWA	Time Weighted Average

Revision history

Revision	Description
1.0	Initial SDS Creation.

Report status

This document has been compiled by RMT on behalf of the manufacturer, importer or supplier of the product and serves as their Safety Data Sheet ('SDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer, importer or supplier or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer, importer or supplier.

While RMT has taken all due care to include accurate and up-to-date information in this SDS, it does not provide any warranty as to accuracy or completeness. As far as lawfully possible, RMT accepts no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person as a consequence of their reliance on the information contained in this SDS.

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