1. IDENTIFICATION OF THE SUBSTANCE / PREPARATION AND OF THE COMPANY / UNDERTAKING

Product Identifier:

Chemical Name (EINECS): Ammonium Bifluoride

Chemical Formula: NH_4HF_2

Trade Names, Synonyms: Ammonium Hydrogen Difluoride. Ammonium Hydrogen Fluoride.

CAS Number: 1341-49-7

EINECS Number: 215-676-4

REACH Registration Number: 01-2119489180-38-XXXX

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

Identified use(s): Manufacture and formulation of Ammonium Bifluoride.
Surface treatment of metals.
Agent in industrial cleaning.
Glass engraving.
Drilling.

Company name: Nexchem Ltd
Unit 3 Barshaw Park
Leycroft Road
Leicester
LE4 1ET
Tel: 0116 2311130
24/7 Emergency Tel: 0800 246 1274
Email: sales@nexchem.co.uk

2. HAZARDS IDENTIFICATION

Classification of the substance or mixture:

Regulation 1272/2008 (CLP): Acute oral toxicity category 3. Cutaneous corrosion category 1B

Label elements:

According to Regulation (EC) No. 1272/2008 (CLP):

Hazard Pictogram:


Signal word(s): Danger.

[cont…]

Hazard statement(s):
H301 Toxic if swallowed
H314 Causes severe skin burns and eye damage

Precautionary statement(s):
P260: Do not breathe dust/fume/gas/mist/vapours/spray.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
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 with water/shower.
P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P309+P311: IF exposed of if you feel unwell: Call a POISON CENTER or doctor/physician.

Physical and Chemical Hazards:
Corrosive for steel, zinc and aluminium, forming flammable gaseous hydrogen. Hygroscopic, with magnification of its corrosive properties.
Corrosive for glass and cement.
When heated to breakdown point, gives off toxic hydrogen fluoride and ammonium gases.
Reacts intensely with lye.
In contact with acids, produces acid fumes of Hydrofluoric acid, and in contact with concentrated lye produces ammonium.

Environmental Hazards:
Toxic effect in fish and plankton, as well as in fixed organisms, due to a variation in pH.

Human Health:
Toxic on inhalation, ingestion and skin contact.
Causes burns.
The absorption of fluoride ions in the blood by inhalation of dust or fumes, by ingestion or skin absorption can reduce serum calcium levels causing possible hypocalcaemia, as well as magnesium causing possible hypomagnesia, besides causing inhibition of vital enzymes.
It can also cause dangerous and notable metabolic disorders and kidney and liver functions.
In cases of prolonged and repeated exposures, the absorption of fluoride ions in the blood can cause fluorosis (fixation of calcium in the bones by fluorides).
The symptoms of overexposure to fluorides may include salivation, nauseas, vomiting, abdominal pain, diarrhoea, fever, hard breathing.
The symptoms of severe poisoning include hard breathing, pulmonary congestion, muscular spasms, convulsions, collapse.

Other hazards:
It is not considered a PBT or vPvB substance.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Substances: Ammonium Bifluoride

CAS Number	EINECS Number	REACH Registration Number	Classification according to Regulation 1272/2008
1341-49-7	215-676-4	01-2119489180-38-XXXX	Acute Tox. 3-H301. Skin Corr. 1A- H314

[cont…]

4. FIRST AID MEASURES

Description of first aid measures:

Inhalation: Causes burns to respiratory tract. It can also cause inflammation in the upper respiratory tract, in the lungs, congestion, pulmonary oedema, fever and cyanosis, which may not appear until 12-24 hours after exposure. Prolonged or repeated exposures to low concentrations may cause nasal congestion, nosebleed and bronchitis. Remove the affected person from the danger area. Make him as comfortable as possible and protect him from cold. Administer calcium tablets as for skin contact. If breathing is laboured, give him oxygen through a face mask. Medical treatment should be sought as soon as possible.

Skin contact: Direct contact with skin, depending on contact time and speed of treatment can cause skin eruption, rash, oedema, and severe and painful burns. These burns can be difficult to detect in the beginning and/or be accompanied by systemic effects. The solutions may also cause burns, difficult to detect at first. Fluoride ions penetrate rapidly through skin and tissues, causing necrosis in soft tissues and bone decalcification. In concentration with other acids, which are rapidly neutralised, this process can continue for days. Quickly remove soiled or splashed clothing. Wash immediately and abundantly with water for at least 5 minutes. Then rub Calcium gluconate gel at 2.5% solution into the affected area until 15 minutes after local pain ceases. Eventually apply dressing or bandage soaked in 10% Calcium Gluconate solution. In case there is no Calcium Gluconate available, washing with water should be prolonged for 15 minutes. For skin burns bigger than a human hand area (150cm2 approx.), additionally administer orally 6 effervescent calcium tablets (400mg calcium per tablet) diluted in water every 2 hours until the patient is admitted to hospital. For very widespread burns, give the patient a full bath in a solution of 1-5% Calcium Gluconate. Medical treatment should be sought as soon as possible.

Eye contact: It is lachrymal and may cause ocular irritation oedemas and severe and painful burns that can cause permanent visual damage. These burns can be difficult to detect at outset. Wash eyes immediately with abundant water, keeping the lids open, for 10-15 minutes, then was with normal isotonic saline solution for 15 minutes. See an ophthalmologist urgently.

Ingestion: It causes necrosis of the mouth, oesophagus and stomach. It can cause nausea, vomiting, diarrhoea and circulatory collapse. Administer the patient, orally, 6 calcium effervescent tablets diluted in water. If such tablets are not available, make him drink milk. Do not induce vomiting. Medical treatment should be sought as soon as possible.

Most important symptoms and effects, both acute and delayed: The immediacy of treatment is essential to reduce the severity of the consequences of burns or poison. Seek medical advice.

Indication of any immediate medical attention and special treatment needed: It is strongly recommended the presence of emergency showers and eye baths close to workstations. Because of the uniqueness of fluorides burns and poisoning, accident assistance and emergency services at local hospitals should be duly informed of the specific and concrete medical treatment required.

[cont…]

5. FIRE-FIGHTING MEASURES

Extinguishing Media: The product is non-combustible and non-carburant. Use fire-extinguishing media appropriate for surrounding materials.

Special Firefighting procedures: Remove containers to a safe area provided this operation can be performed safely. Above 230ºC, formation of Hydrofluoric Acid and Ammonium.

Advice for fire-fighters: Breathing apparatus and full chemical protective clothing should be worn when extinguishing fires.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures:

Provide good ventilation. Those fighting the spill should wear suitable protective clothing (see section 8). Restrict access to area until completely clean to people who do not use personal protective equipment. Prevent the entry of product in basements.

Environmental precautions: Prevent soil, water and drain pollution. Extracted air, which may be contaminated with large amounts of fumes, should be treated with a washing system using the moist way before being released into the atmosphere.

Methods and material for containment and cleaning up:

Collect mechanically avoiding dust formation. Place the material collected in lockable vessels duly marked. Do not dispose of waste via the drainage system. Immediately wash the zone thoroughly with abundant water.

Reference to other sections: See sections 8 and 13.

7. HANDLING AND STORAGE

Precautions for safe handling: Avoid inhalation, absorption and contact with the product. Handle and open the vessel with care, avoiding spillage and dust formation. Provide good ventilation. Partially used vessels should be hermetically re-sealed after use and be returned to storage. Empty vessels contain residues and therefore they should be handled as if full.

Conditions for safe storage, including any incompatibilities:

The store should be situated in a dry and well-ventilated place, adapted to toxic products, far from heat sources and incompatible products. If possible, the product should be stored in its original container, hermetically sealed. Do not store close to foodstuffs intended to human or animal consumption. Suitable packaging: Paper bags with inner plastic bag, plastic drums or plasticised cardboard, plastic GRG

Specific end uses: See Section 1.2.

[cont…]

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters:

Name	STD	TWA – 8 Hrs	STEL – 15 Min	Notes
Ammonium Bifluoride	WEL	2.5 mg/m3		

DNEL: Derived No Effect Level:

Acute effects (systemic and local): Inhalation, 3.8 mg/m3, irritation (respiratory tract) workers.

Long term effects (systemic and local): Inhalation, 2.3 mg/m3, irritation (respiratory tract) workers.

PNEC: Predicted No Effect Concentration:

Fresh water: 1.3 mg/l.

Salt water: Background levels of F-are higher than the PNEC. Not applicable.

Sediment: Not required.

Exposure controls:

Process Conditions: Local vacuuming is recommended to maintain the emissions of dust or fumes at the lowest admissible level for exposure. Periodical controls should be done to working environment.

Appropriate engineering controls: Wear personal protective equipment. Do not eat, drink or smoke while handling the product. Before breaks, wash hands. After work shower or wash. Change working clothes after handling the product. Remove soiled or splashed clothing and wash it before re-using. Shower and washroom facilities should be separate from changing rooms. The substance must be kept away from food, drink and condiments.

Respiratory protection: If engineering checks, working, practices or administrative checks are not effective in reducing concentrations to below legal limits for exposure, use breathing apparatus. Depending on the level of fumes or dust, the appropriate breathing equipment – all of them EPI's of class 3-, could be a facemask with replaceable filters type P1E1 – P2E2, type hood with eye-windows of suitable plastic and replaceable filters, or autonomous insulation equipment or with airline.

Hand protection: Chemical protective gloves of a suitable material (e.g. Viton, Neoprene, PVC)

Eye protection: Well-fitting chemical protective goggles, type motorist or diver, with plastic lenses (e.g. clear PVC), or a facial safety screen. It is generally known that contact lenses must not be worn when working with chemicals because they may contribute to the severity of possible damage to the eyes.

Skin protection: In normal conditions, an apron or suitable material (e.g. Viton, Neoprene), normal protective overall with long sleeves, and chemical protective boots (e.g. Viton, Neoprene). Additionally, for works with possible contact, wear EPI's class3 type3 (liquid tightness of suitable material (Composite, Viton, PVC), and for emergencies and EPI class 3, type 1 (gasproof) of the same materials, with autonomous breathing equipment.

[cont…]

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties:

Appearance:	White crystalline solid
Odour:	Acrid
Odour threshold:	No data available
pH:	2 - 3 @ 20°C
Melting point/freezing point:	125.6-126°C
Boiling point/boiling range:	239.5-240°C
Flash point:	Non flammable
Evaporation rate:	No data available
Flammability:	Non flammable
Explosive limits:	Nonexplosive
Vapour pressure:	1.08 Pa @ 20°C
Vapour density:	Not applicable
Relative density:	1.5 g/cm3
Water solubility:	6.02 x 105 mg/1 @ 20°C
Solubility in other chemicals:	No data available

Partition coefficient/n-Octanol/water: No data available

Auto ignition temperature:	Non flammable
Decomposition temperature:	239.5-240°C
Viscosity:	Solid at environment temperature
Explosive properties:	Nonexplosive
Carburant properties:	Non comburant

Other information:

Miscibility:	Miscible in water
Liposolubility:	No data available
Conductivity:	No data available

10. STABILITY AND REACTIVITY

Reactivity: Strong mineral acids and concentrated lye. Contact with steel and many other metals, especially in presence of moisture.

Chemical stability: It is stable under normal conditions.

Possibility of hazardous reactions: With strong acids forms HF. With concentrated lye, forms NH3.

Conditions to avoid: Heating above 70°C, moisture. The product must be kept dry.

Incompatible materials: With steel, zinc, aluminium and in general with ignoble metals, forms flammable gaseous hydrogen. Corrosive for glass and cement.

Hazardous decomposition products: With strong acids forms HF. With concentrated lye, form NH3. With steel, zinc, aluminium and in general with ignoble metals, forms flammable gaseous hydrogen. [cont…]

11. TOXICOLOGICAL INFORMATION

Toxic Dose 1 – LD50 130 mg/kg (oral, rat)

Further toxicological information: Testing for dermal and inhalation acute toxicity are not necessary and cannot be justified on animal welfare.

Skin corrosion/irritation: Corrosive substance to skin and respiratory system. The substance is readily soluble in aqueous media to produce hydrofluoric acid, which is responsible for the corrosive effects in the skin.

Serious eye damage/irritation: Corrosive substance to the eyes. The substance is readily soluble in aqueous media to produce hydrofluoric acid, which is responsible for the corrosive effects in the eye.

Respiratory or skin sensitisation: Respiratory or skin sensitisation not produced.

Germ cell mutagenicity: It is not considered mutagenic.

Carcinogenicity: It is not considered carcinogenic.

Reproductive toxicity: It is not considered toxic for reproduction

Specific Target Organ Toxicity (STOT) – single exposure: In view of the available data, the criteria for classification are not met.

Specific Target Organ Toxicity (STOT) – repeated exposure: In view of the available data, the criteria for classification are not met.

Aspiration hazard: Corrosive substance by inhalation. The substance is readily soluble in aqueous media to produce Hydrofluoric acid, which is responsible for the corrosive effects in the skin.

12. ECOLOGICAL INFORMATION

Acute Fish Toxicity: Toxic effect on fish and plankton, plants and foliage.

Acute toxicity to freshwater fish: LC50 = 422 mg/l.

Long term toxicity to freshwater fish: EC10 / LC10 4 mg/l

Water toxicity to freshwater invertebrates: EC50/LC50: 26 mg/l

Long term toxicity to invertebrates water sweet: 8.9 mg/l

Persistence and degradability: No experimental data available.

Bio accumulative potential: The product has bioaccumulative potential in aquatic organisms.

Mobility in soil: The natural alkalinity of the soil will slowly dissipate the acidity. If the pH is >6.5, the soil will strongly bond to the fluorides. High calcium content will also immobilise fluorides

Results of PBT and vPvB assessment: It is not considered a PBT or vPvB substance.

Other adverse effects: Avoid penetration into surface waters, wastewater and into the ground.

[cont…]

13. DISPOSAL CONSIDERATIONS

Product: Use as much of the product as possible in the production cycle. The product packed in dry sealed vessels should be given to an authorised waste agent in order to manage its elimination that will be probably be done by means of a physiochemical treatment and later settlement in a controlled chemical waste weir. Another alternative is to dilute the product with water and neutralise with an alkali. Fluoride ions can be eliminated using Calcium Hydroxide that will precipitate insoluble Calcium Fluoride. The dehydrated sludge can be deposited in an authorised chemical waste weir. Liquid wastes generated, after being neutralised and diluted, may be treated in the local waste waters treatment plant.

Empty Packaging: Dispose of in accordance with all local and national legislation

14. TRANSPORT INFORMATION

Proper Shipping Name: AMMONIUM HYDROGEN DIFLUORIDE SOLID
Environmentally Hazardous:
Substance/Marine Pollutant: No
UN NO. road: 1727
ADR Class No.: 8
ADR Pack Group: II

15. REGULATORY INFORMATION

It is not included in Regulation (EC) 689/2008 on the export and import of dangerous chemicals.
Being toxic, it is included in SEVESO category.

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.

16. OTHER INFORMATION

Legal disclaimer: The information contained in this SDS does not constitute a risk assessment, and should not replace the user's own assessment of risks as required by other health and safety legislation. This advice is given by Nexchem Ltd who accept no legal liability for it except otherwise provided by law. The information contained herein is based on the present state of our knowledge and is intended to describe our products from the point of view of safety requirements. It should not therefore be construed as guaranteeing specific properties.