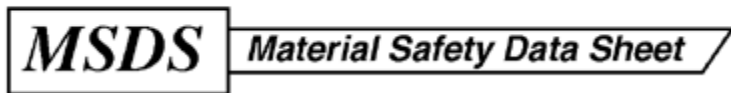


MSDS Number: **A5628** * * * * * *Effective Date: 02/22/06* * * * * * *Supercedes:*
08/10/04



From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865



Mallinckrodt
CHEMICALS



24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

AMMONIUM BIFLUORIDE

1. Product Identification

Synonyms: Ammonium hydrogen fluoride; ammonium difluoride; acid ammonium fluoride

CAS No.: 1341-49-7

Molecular Weight: 57.04

Chemical Formula: NH₄F HF

Product Codes:

J.T. Baker: 0619

Mallinckrodt: 3396

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent
Hazardous		
-----	-----	-----

Ammonium Bifluoride	1341-49-7	100%
Yes		

3. Hazards Identification

Emergency Overview

DANGER! MAY BE FATAL IF SWALLOWED OR INHALED. AFFECTS RESPIRATORY SYSTEM, HEART, SKELETON, CIRCULATORY SYSTEM, CENTRAL NERVOUS SYSTEM AND KIDNEYS. CAUSES IRRITATION AND BURNS TO SKIN, EYES AND RESPIRATORY TRACT. IRRITATION AND BURN EFFECTS MAY BE DELAYED. HARMFUL IF ABSORBED THROUGH SKIN.

SAF-T-DATA^(tm) Ratings (Provided here for your convenience)

Health Rating: 4 - Extreme (Life)

Flammability Rating: 0 - None

Reactivity Rating: 2 - Moderate

Contact Rating: 4 - Extreme (Corrosive)

Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES

Storage Color Code: White (Corrosive)

Potential Health Effects

If inhaled or swallowed, this compound can cause fluoride poisoning. Early symptoms include nausea, vomiting, diarrhea, and weakness. Later effects include central nervous system effects, cardiovascular effects and death.

Inhalation:

May cause irritation and burns to the respiratory tract, symptoms may include coughing, sore throat, and labored breathing. May be absorbed through inhalation of dust; symptoms may parallel those from ingestion exposure. Irritation and burning effects may not appear immediately.

Ingestion:

May cause salivation, nausea, vomiting, diarrhea, and abdominal pain, followed by symptoms of weakness, tremors, shallow respiration, carpopedal spasm, convulsions, and coma. May cause brain and kidney damage. Affects heart and circulatory system. Death may be caused by respiratory paralysis. Lethal dose estimated at between 1 teaspoonful and 1 oz.

Skin Contact:

Causes irritation and burns to the skin. Effects may not appear immediately.

Eye Contact:

Causes irritation. May be extremely irritating with possible burns to eye tissue and

permanent eye damage may result.

Chronic Exposure:

Chronic exposure may cause mottling of teeth and bone damage (osteosclerosis) and fluorosis. Symptoms of fluorosis include brittle bones, weight loss, anemia, calcified ligaments, general ill health and joint stiffness.

Aggravation of Pre-existing Conditions:

Populations that appear to be at increased risk from the effects of fluoride are individuals that suffer from diabetes insipidus or some forms of renal impairment.

4. First Aid Measures

First aid procedures should be pre-planned for fluoride compound emergencies.

Inhalation:

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. CALL A PHYSICIAN IMMEDIATELY.

Ingestion:

Administer milk, chewable calcium carbonate tablets or milk of magnesia. Never give anything by mouth to an unconscious person. CALL A PHYSICIAN IMMEDIATELY.

Skin Contact:

Wipe off any excess material from skin and then immediately flush skin with large amounts of soapy water. Remove contaminated clothing and shoes. Wash clothing before re-use. Apply bandages soaked in magnesium sulfate. CALL A PHYSICIAN IMMEDIATELY.

Eye Contact:

Immediately flush eyes with gentle but large stream of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Call a physician immediately.

Note to Physician:

For large exposures, systemic effects (hypocalcemia and hypomagnesia) may occur.

5. Fire Fighting Measures

Fire:

Not considered to be a fire hazard.

Explosion:

Contact with water and metal at the same time may evolve flammable hydrogen gas.

Fire Extinguishing Media:

Dry chemical, foam or carbon dioxide. Do not use water.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Pick up and place in a suitable container for reclamation or disposal, using a method that does not generate dust. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

7. Handling and Storage

Keep in a tightly closed container. Store in a cool, dry, ventilated area. Protect against physical damage. Separate from acids and alkalis. Do not store in metal containers, as contact with moisture and metal at the same time may release flammable hydrogen gas. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:

-OSHA Permissible Exposure Limit (PEL):

2.5 mg(F)/m³ (TWA)

-ACGIH Threshold Limit Value (TLV):

2.5 mg(F)/m³ (TWA)

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):

If the exposure limit is exceeded and engineering controls are not feasible, a half facepiece particulate respirator (NIOSH type N95 or better filters) may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece particulate respirator (NIOSH type N100 filters) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency, or respirator supplier, whichever is lowest. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure,

air-supplied respirator. **WARNING:** Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eye Protection:

Use chemical safety goggles and/or full face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:

White crystals.

Odor:

Odorless.

Solubility:

41.5g/100 g Water @ 25C (68F)

Specific Gravity:

1.51

pH:

3.5 (5% solution)

% Volatiles by volume @ 21C (70F):

0

Boiling Point:

240C (464F)

Melting Point:

124.6C (257F)

Vapor Density (Air=1):

No information found.

Vapor Pressure (mm Hg):

No information found.

Evaporation Rate (BuAc=1):

No information found.

10. Stability and Reactivity

Stability:

Stable under ordinary conditions of use and storage.

Hazardous Decomposition Products:

Emits toxic fumes of hydrogen fluoride, nitric oxides, and ammonia when heated to decomposition. Upon contact with moisture and metal, this material may release hydrogen gas.

Hazardous Polymerization:

Will not occur.

Incompatibilities:

Reacts with acids to liberate hydrogen fluoride and base to liberate ammonia. When combined with moisture, will corrode glass, cement and most metals.

Conditions to Avoid:

No information found.

11. Toxicological Information

No LD50/LC50 information found relating to normal routes of occupational exposure.

Ingredient Category	---NTP Carcinogen---		IARC
	Known	Anticipated	
Ammonium Bifluoride (1341-49-7)	No	No	
None			

12. Ecological Information

Environmental Fate:

This material is not expected to significantly bioaccumulate. When released into water, this material may biodegrade to a moderate extent.

Environmental Toxicity:

This material is not expected to be toxic to aquatic life. The LC50/96-hour values for fish are over 100 mg/l.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Although not a listed RCRA hazardous waste, this material may exhibit one or more characteristics of a hazardous waste and require appropriate analysis to determine specific disposal requirements. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: RQ, AMMONIUM HYDROGEN DIFLUORIDE, SOLID
Hazard Class: 8
UN/NA: UN1727
Packing Group: II
Information reported for product/size: 100LB

International (Water, I.M.O.)

Proper Shipping Name: AMMONIUM HYDROGEN DIFLUORIDE, SOLID
Hazard Class: 8
UN/NA: UN1727
Packing Group: II
Information reported for product/size: 100LB

International (Air, I.C.A.O.)

Proper Shipping Name: AMMONIUM HYDROGEN DIFLUORIDE, SOLID
Hazard Class: 8
UN/NA: UN1727
Packing Group: II
Information reported for product/size: 100LB

15. Regulatory Information

-----\Chemical Inventory Status - Part 1\-----

Ingredient	TSCA	EC	Japan
Australia			
Ammonium Bifluoride (1341-49-7)	Yes	Yes	Yes

Yes

-----\Chemical Inventory Status - Part 2\-----

Ingredient	Korea	Phil.	---Canada---	
			DSL	NDSL
Ammonium Bifluoride (1341-49-7)	Yes		Yes	No

Yes

-----\Federal, State & International Regulations - Part 1\-----

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-SARA 302- -----SARA

Ingredient Chemical Catg.	RQ	TPQ	List
Ammonium Bifluoride (1341-49-7)	No	No	No
-----\Federal, State & International Regulations - Part 2\-----			
TSCA- Ingredient	CERCLA	261.33	8 (d)
Ammonium Bifluoride (1341-49-7)	100	No	No

Chemical Weapons Convention: Yes TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
Reactivity: No (Pure / Solid)

Australian Hazchem Code: 2X

Poison Schedule: S6

WHMIS:

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: **3** Flammability: **0** Reactivity: **0**

Label Hazard Warning:

DANGER! MAY BE FATAL IF SWALLOWED OR INHALED. AFFECTS RESPIRATORY SYSTEM, HEART, SKELETON, CIRCULATORY SYSTEM, CENTRAL NERVOUS SYSTEM AND KIDNEYS. CAUSES IRRITATION AND BURNS TO SKIN, EYES AND RESPIRATORY TRACT. IRRITATION AND BURN EFFECTS MAY BE DELAYED. HARMFUL IF ABSORBED THROUGH SKIN.

Label Precautions:

- Do not breathe dust.
- Keep container closed.
- Use only with adequate ventilation.
- Wash thoroughly after handling.
- Do not get in eyes, on skin, or on clothing.

Label First Aid:

In all cases call a physician immediately. First Aid procedures should be pre-planned for fluoride compound emergencies. If swallowed, administer milk, chewable calcium carbonate tablets or milk of magnesia. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing difficult, give artificial respiration. In case of skin contact wipe off any excess

material then immediately flush skin with large amounts of soapy water. Remove contaminated clothing and shoes. Wash clothing before re-use. Apply bandages soaked in magnesium sulfate. In case of eye contact, immediately flush eyes with gentle but large stream of water for at least 15 minutes, lifting upper and lower eyelids occasionally.

Product Use:

Laboratory Reagent.

Revision Information:

MSDS Section(s) changed since last revision of document include: 3.

Disclaimer:

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