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

Ashland	Regulatory Information Number	1-800-325-3751
P.O. Box 2219	Telephone	614-790-3333
Columbus, OH 43216	Emergency telephone number	1-800-ASHLAND (1-800-274-5263)

Product name	HYDROFLUORIC ACID 49%
Product code	58844
Product Use Description	No data

2. HAZARDS IDENTIFICATION

Emergency Overview

Appearance: liquid, Clear colorless

DANGER! POISON! Corrosive to eyes.

Potential Health Effects

Routes of Exposure

Inhalation, Skin absorption, Skin contact, Eye Contact, Ingestion

Eye Contact

Can cause permanent eye injury. Symptoms include stinging, tearing, redness, and swelling of eyes. Can injure the cornea and cause blindness.

Skin Contact

Both the liquid and vapor can cause severe burns which may not be immediately painful or visible. Pain may become gradually more severe, possibly taking 1-24 hours to become noticable. These burns can be very deep, possibly causing bone damage, and are very slow to heal. Even solutions containing 2% or less hydrogen fluoride or other inorganic fluoride compounds can cause burns and tissue damage. Passage of this material into the body through the skin is possible, and skin contact may be harmful or fatal.

Ingestion

Swallowing this material may be harmful or fatal. Symptoms may include severe stomach and intestinal irritation (nausea, vomiting, diarrhea), abdominal pain, and vomiting of blood. Swallowing this material may cause burns and destroy tissue in the

mouth, throat,and digestive tract. Low blood pressure and shock may occur as a result of severe tissue injury.

Inhalation

Breathing of vapor or mist is possible. Breathing this material may be harmful or fatal. Symptoms may include severe irritation and burns to the nose, throat, and respiratory tract.

Aggravated Medical Condition

Preexisting disorders of the following organs (or organ systems) may be aggravated by exposure to this material:, skin, lung (for example, asthma-like conditions), liver, kidney, nervous system, bone, Exposure to this material may aggravate any preexisting condition sensitive to a decrease in available oxygen, such as chronic lung disease, coronary artery disease or anemias., Individuals with preexisting heart disorders maybe more susceptible to arrhythmias (irregular heartbeats) if exposed to high concentrations of this material.

Symptoms

Signs and symptoms of exposure to this material through breathing, swallowing, and/or passage of the material through the skin may include:, irritation (nose, throat, airways), cough, sneezing, headache, difficult breathing, lung edema (fluid buildup in the lung tissue), lung damage, and death

Target Organs

Repeated, prolonged overexposure to inorganic fluoride compounds may result in gastrointestinal disturbances, loss of weight, anemia (reduced number of red blood cells), diseases of the teeth,and skeletal fluorosis. Skeletal fluorosis is characterized by bone and joint pain, limited motion in the joints or spine, increased bone density which can cause the bones to become brittle, and hardening of ligaments., Overexposure to this material (or its components) has been suggested as a cause of the following effects in laboratory animals:, nervous system effects, blood abnormalities, liver abnormalities, kidney damage

Carcinogenicity

Based on the available information, this material cannot be classified with regard to carcinogenicity. This material is not listed as a carcinogen by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP), or the Occupational Safety and Health Administration (OSHA).

Reproductive Hazard

This material (or a component) has been shown to cause harm to the fetus in laboratory animal studies. Harm to the fetus occurs only at exposure levels that harm the pregnant animal. The relevance of these findings to humans is uncertain.

Other Information

Hydrofluoric acid has been shown to cause permanent changes in the DNA of insect germ cells. Changes in these cells can be passed to the next generation. The relevance of this finding to human health is uncertain.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS-No.	Concentration
HYDROFLUORIC ACID	7664-39-3	>=40-<50%

4. FIRST AID MEASURES

Eyes

If material gets into the eyes, immediately flush eyes gently with water for at least 15 minutes while holding eyelids apart. If symptoms develop as a result of vapor exposure, immediately move individual away from exposure and into fresh air before flushing as recommended above. Seek immediate medical attention.

Skin

Immediately flush contaminated skin with large quantities of cool running water for 5 minutes. Remove contaminated clothing while flushing contaminated skin. Immediately after washing, apply 2.5% calcium gluconate gel to all affected skin areas. (Note: If gel is not prepared within 5 minutes, continue flushing until gel is prepared.) The gel should be massaged into the affected skin by personnel wearing gloves to prevent skin contamination during first aid. Gel should be applied every 15 minutes and massaged continuously. Instead of calcium gluconate treatment, the affected areas may be soaked in iced 0.13% benzalkonium chloride solution (Zephiran chloride). Use ice cubes rather than shaved ice to prevent frostbite. If it is not practical to immerse affected area, towels should be soaked with iced 0.13% benzalkonium chloride solution and used as compresses for the burned area. Compresses should be changed every 2-3 minutes and continued until pain is relieved or victim is seen by a physician. If neither calcium gluconate nor benzalkonium chloride is available, use an iced saturated water solution of magnesium sulfate (Epsom salts), or if that is not available, iced 70% alcohol or ice water. Local anesthetics should be avoided since relief of pain indicates success of the treatment. ***Get medical attention as soon as possible.*** ::::NOTE::::Calcium gluconate gel can be prepared by mixing a 10 milliliter ampule of calcium gluconate with a 2-ounce tube of K-Y jelly (Johnson & Johnson). After a jar of this mixture has been opened and used, it should be discarded to prevent bacterial or chemical contamination.

Ingestion

Seek immediate medical attention. Do not induce vomiting. If individual is conscious and alert, immediately rinse mouth with water and give milk to drink (one-half to one glassful), chewable calcium carbonate tablets, or milk of magnesia. The calcium in milk and the magnesium in milk of magnesium will act as an antidote in cases of hydrofluoric acid ingestion. If possible, do not leave individual unattended.

Inhalation

If symptoms develop, immediately move individual away from exposure and into fresh air. Seek immediate medical attention; keep person warm and quiet. If person is not breathing, begin artificial respiration. If breathing is difficult, administer oxygen.

Notes to Physician

Hazards: This product contains hydrofluoric acid (HF). Acute local effects from HF exposure are concentration-dependent. If untreated or exposure is prolonged, even dilute solutions of HF can cause delayed toxicity following penetration to subcutaneous tissue. Acute systemic toxicity is largely dependent upon the total amount of fluoride ion absorbed. Thus ingestion, skin contact or significant inhalation can cause severe systemic effects including electrolyte (calcium, magnesium, potassium) and acid-base abnormalities with resulting cardiovascular effects. Exposure of >5% of the body surface area with any concentration of HF may predispose the patient to development of hypocalcemia. Chronic exposure to less than acutely toxic amounts of HF is a low toxicity hazard. Repeated exposure and absorption of 10-80 mg of fluoride per day may produce systemic fluorosis.

Treatment: No information available.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media

water spray

Hazardous Combustion Products

May form:, acid vapors, hydrogen fluoride

Precautions for Fire-Fighting

Wear full firefighting turn-out gear (full Bunker gear), and respiratory protection (SCBA). Use water spray to cool fire exposed containers and structures until fire is out if it can be done with minimal risk. Avoid spreading burning liquid with water used for cooling purposes.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions

No data

Environmental Precautions

No data

Methods for Cleaning Up

Persons not wearing protective equipment should be excluded from area of spill until clean-up is completed. Stop spill at source. Dike to prevent spreading. Pump to salvage tank. Cover the contaminated surface with sodium bicarbonate or a soda ash/flaked lime mixture (50-50). Mix and add water if necessary to form a slurry. Scoop up slurry and wash site with soda ash solution. Proper mixing procedures are essential. Trained personnel should conduct this procedure. Untrained personnel should be removed from the spill area.

7. HANDLING AND STORAGE

Handling

Containers of this material may be hazardous when emptied. Since emptied containers retain product residues (vapor, liquid, and/or solid), all hazard precautions given in the data sheet must be observed. Addition to water releases heat which can result in violent boiling and spattering. Always add slowly and in small amounts. Never use hot water. Never add water to acids. Always add acids to water.

Storage

No data

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Guidelines

HYDROFLUORIC ACID		**7664-39-3**
ACGIH	time weighted average	0.5 ppm
ACGIH	Ceiling Limit Value:	2 ppm
OSHA Z2	time weighted average	3 ppm
NIOSH	Recommended exposure limit (REL):	3 ppm
NIOSH	Recommended exposure limit (REL):	2.5 mg/m3
OSHA Z1A	time weighted average	3 ppm
OSHA Z1A	Short term exposure limit	6 ppm
NIOSH	Ceiling Limit Value and Time Period (if specified):	6 ppm
NIOSH	Ceiling Limit Value and Time	5 mg/m3

	Period (if specified):	
US CA OEL	Time Weighted Average (TWA)	3 ppm
	Permissible Exposure Limit (PEL):	
US CA OEL	Time Weighted Average (TWA)	2.5 mg/m3
	Permissible Exposure Limit (PEL):	
US CA OEL	Short term exposure limit	6 ppm
OSHA Z1	Permissible exposure limit	2.5 mg/m3

General Advice

These recommendations provide general guidance for handling this product. Personal protective equipment should be selected for individual applications and should consider factors which affect exposure potential, such as handling practices, chemical concentrations and ventilation. It is ultimately the responsibility of the employer to follow regulatory guidelines established by local authorities.

Exposure Controls

Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure below TLV(s).

Eye Protection

Chemical splash goggles and face shield (8" min.) in compliance with OSHA regulations are advised; however, OSHA regulations also permit other type safety glasses. (Consult your industrial hygienist.)

Skin and Body Protection

To prevent skin contact, wear impervious clothing and boots.Wear resistant gloves such as:
Neoprene
polyvinyl chloride

Respiratory Protection

If workplace exposure limit(s) of product or any component is exceeded (see exposure guidelines), a NIOSH-approved air supplied respirator is advised in absence of proper environmental control. OSHA regulations also permit other NIOSH respirators (negative pressure type) under specified conditions (see your industrial hygienist). Engineering or administrative controls should be implemented to reduce exposure.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state	liquid
Form	No data
Colour	Clear colorless
Odour	No data

Boiling point/range	227 °F / 108 °C@ 760 mmHg
pH	No data
Flash point	No data
Evaporation rate	> 1 Ethyl Ether
Explosion limits	No data
Vapour pressure	10.00 mmHg @ 68.00 °F / 20.00 °C
Vapour density	0.07
Density	1.176 g/cm3 @ 68.00 °F / 20.00 °C
	No data
Solubility	No data
Partition coefficient (n-octanol/water)	No data
Autoignition temperature	No data

10. STABILITY AND REACTIVITY

Stability

Stable.

Conditions to Avoid

None known.

Incompatible Products

Avoid contact with:, organic materials, strong alkalis

Hazardous Decomposition Products

May form:, acid vapors, hydrogen fluoride

Hazardous Reactions

Product will not undergo hazardous polymerization., Acid reacts with most metals to release hydrogen gas which can form explosive mixtures with air.

Thermal Decomposition

No data

11. TOXICOLOGICAL INFORMATION

Acute Oral Toxicity

Acute Inhalation Toxicity

HYDROFLUORIC ACID	LC 50 Rat: 1276 ppm, 1 h

Acute Dermal Toxicity

12. ECOLOGICAL INFORMATION

Aquatic Toxicity

Acute and Prolonged Toxicity to Fish
No data

Acute Toxicity to Aquatic Invertebrates
No data

Environmental Fate and Pathways
No data

13. DISPOSAL CONSIDERATIONS

Waste Disposal Methods
Collect and add slowly to large volume of agitated solution of soda ash and slaked lime. Add neutralized solution to excess running water in accordance with applicable regulations.

14. TRANSPORT INFORMATION

IMDG:
UN1790, HYDROFLUORIC ACID SOLUTION 8 (6.1), II
IATA_P:
UN1790, Hydrofluoric acid Solution 8 (6.1), II
IATA_C:
UN1790, Hydrofluoric acid Solution 8 (6.1), II
CFR_ROAD:
UN1790, Hydrofluoric acid Solution 8 (6.1), II
CFR_RAIL:
UN1790, Hydrofluoric acid Solution 8 (6.1), II
CFR_INWTR:
UN1790, Hydrofluoric acid Solution 8 (6.1), II

Dangerous goods descriptions may not reflect package size, quantity, end-use or region-specific exceptions that can be applied to shipments. Consult shipping documents for material-specific descriptions.

15. REGULATORY INFORMATION

California Prop. 65
This product does not contain any chemicals known to State of California to cause cancer, birth defects or any other harm.

SARA Hazard Classification Acute Health Hazard

SARA 313 Component(s)

HYDROFLUORIC ACID	7664-39-3	49%

OSHA Hazards Corrosive to eyes

	Health	Flammability	Reactivity	Other
HMIS	4	1	0	
NFPA	4	1	0	

16. OTHER INFORMATION

The information accumulated herein is believed to be accurate but is not warranted to be whether originating with the company or not. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances.

This MSDS has been prepared by Ashland's Environmental Health and Safety Department (1-800-325-3751).