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MSDS: Hydrogen Fluoride

PRODUCT INFORMATION

PRODUCT: Hydrogen Fluoride

TRADE NAME: Hydrogen Fluoride; Hydrogen Fluoride, Anhydrous

CHEMICAL NAME: Hydrogen Fluoride; Anhydrous Hydrofluoric Acid

SYNONYMS: Hydrogen Fluoride, Anhydrous

FORMULA: HF

CHEMICAL FAMILY: Inorganic Acid (Anhydrous)

SUPPLIER'S NAME: MEGS Inc.

SUPPLIER'S ADDRESS: 2675 De Miniac
Ville St-Laurent, Qc, H4S 1E5

EMERGENCY PHONE NUMBER: (514) 956-7503

MOLECULAR WEIGHT: 20.01

PRODUCT USE: Various

PRODUCT IDENTIFICATION NUMBER: UN 1052

HAZARDOUS INGREDIENTS

CHEMICAL ID	CONCENTRATION	CAS #	LD(50)	LC(50)
Hydrogen Fluoride	100%	7664-39-3	Ipr-Rat 25 mg/kg	Ihl-Rat 1276 ppm/1 h

PHYSICAL DATA

PHYSICAL STATE: Liquid and gas under slight pressure

APPEARANCE: Colorless liquid and gas

ODOR: Pungent, irritating

ODOR THRESHOLD: Unknown

SPECIFIC GRAVITY (H_2O = 1): 0.786

VAPOR PRESSURE:	86 kPa @ 15°C
VAPOR DENSITY (air = 1):	2.0
EVAPORATION RATE:	Unknown
BOILING POINT:	19.5°C
FREEZING POINT:	-83.4°C
pH:	Slightly acidic
GAS DENSITY:	1.50 kg/m³ @ 15°C, 101.3 kPa
COEFFICIENT OF WATER/OIL DISTRIBUTION:	Reacts violently with water

FIRE OR EXPLOSION HAZARD

CONDITIONS OF FLAMMABILITY:	Nonflammable gas
MEANS OF EXTINCTION:	Nonflammable gas
FLASHPOINT AND METHOD OF DETERMINATION:	Nonflammable gas
UPPER EXPLOSION LIMIT (% BY VOL):	Nonflammable gas
LOWER EXPLOSION LIMIT (% BY VOL):	Nonflammable gas
AUTO-IGNITION TEMPERATURE:	Nonflammable gas
FLAMMABILITY CLASSIFICATION:	Nonflammable gas
HAZARDOUS COMBUSTION PRODUCTS:	Nonflammable gas
EXPLOSION DATA:	Nonflammable gas
SENSITIVITY TO STATIC DISCHARGE:	No

REACTIVITY DATA

CHEMICAL STABILITY:	Stable
INCOMPATIBLE MATERIALS:	Water, organic, materials, metals
CONDITIONS OF REACTIVITY:	Ambient
HAZARDOUS DECOMPOSITION PRODUCTS:	Hydrogen and toxic fluoride compounds

TOXICOLOGICAL PROPERTIES

ROUTES OF ENTRY:

SKIN CONTACT: It hydrolyzes very rapidly yielding hydrofluoric acid so that skin burns and mucosal irritation are like that from exposure to that acid. Hydrofluoric acid dermal burns exhibit severe pain, redness, possible swelling and early necrosis.

SKIN ABSORPTION: Unknown

EYE: See Skin Contact, above.

INHALATION: Corrosive and irritating to the upper and lower respiratory tracts. Symptoms include lachrymation, cough, labored breathing and excessive salivary and sputum formation. Excessive irritation of the lungs causes acute pneumonitis and pulmonary edema which could be fatal.

INGESTION: None

ACUTE OVER EXPOSURE EFFECTS: Hydrogen fluoride's sharp, pungent odor provides a useful warning of acutely toxic levels in the atmosphere. It is irritating and corrosive to all living tissues. Toxic level exposure to dermal tissue causes hydrofluoric acid burns and skin lesions resulting in necrosis and eventual scarring. Burns are progressive while any residual active fluorides remain. Chemical pneumonitis and pulmonary edemas result from exposure to the lower respiratory tract and deep lung. Residual pulmonary malfunction might also occur. Burns to the eye result in lesions and possible loss of vision.

CHRONIC OVER EXPOSURE EFFECTS: Extended low level systemic absorption of hydrogen fluoride may cause fluorosis, an abnormal calcification pattern of the skeletal system.

EXPOSURE LIMITS: Ceiling limit (as F) = 3 molar ppm (ACGIH 1995-1996)

IRRITANCY OF PRODUCT: See Skin and Eye Contact, above.

SENSITIZATION TO MATERIAL: None known

CARCINOGENICITY, REPRODUCTIVE EFFECTS: None known

TERATOGENICITY, MUTAGENICITY: Sex chromosome loss - drosophila melanogaster-lhl-2900 ppb

TOXICOLOGICALLY SYNERGISTIC PRODUCTS: Other inorganic acids (anhydrous)

PREVENTIVE MEASURES

PERSONAL PROTECTIVE EQUIPMENT: Plastic or rubber gloves. Safety goggles or safety glasses and face shield. Safety shoes, safety shower and eyewash "fountain". Protective apron.

SPECIFIC ENGINEERING CONTROLS: Carbon steel (without non-metallic

inclusions) is the preferred material for handling hydrogen fluoride up to approximately 65°C. For higher temperatures Monel®, Inconel®, nickel or copper should be used. Cast iron or malleable fittings should not be used. Polyethylene, copper (soft), Kel-F® or Teflon® are the preferred gasket or "packing" material. Most metals form a passive fluoride film that protects the metal form further corrosion.

LEAK AND SPILL PROCEDURES: EVACUATE ALL PERSONNEL FROM AFFECTED AREA.
Use appropriate protective equipment. If leak is in user's equipment, be certain to purge piping with an inert gas prior to attempting repairs. If leak is on container or container valve, contact the closest MEGS location.

WASTE DISPOSAL: Do not attempt to dispose of waste or unused quantities. Return in the shipping container properly labeled, with any valve outlet plugs or caps secured and valve protection cap in place to MEGS for proper disposal. For emergency disposal, contact the closest MEGS location.

HANDLING PROCEDURES AND EQUIPMENT: USE ONLY IN WELL-VENTILATED AREAS.
Valve protection caps must remain in place unless container is secured with valve outlet piped to the point of use. Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Do not heat cylinder by any means to increase the discharge rate of product from the cylinder. Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder. Close valve after each use and when empty.

STORAGE REQUIREMENTS: Protect cylinders from physical damage. Store in cool, dry, well-ventilated area of non combustible construction away from heavily trafficked areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 52°C. Cylinders must be stored upright and firmly secured to prevent falling or being knocked over. Full and empty cylinders should be segregated. Use a "first in - first out" inventory system to prevent full cylinders being stored for excessive periods of time.

TDG CLASSIFICATION: 8 (6.1)

WHMIS CLASSIFICATION: A, E

SPECIAL SHIPPING INFORMATION: Always secure cylinders in an upright position before transporting them. NEVER transport cylinders in trunks of vehicles, enclosed vans, truck cabs or in passenger compartments. Transport cylinders secured in open flatbed or in open pick-up type vehicles.

FIRST AID MEASURES

SPECIFIC FIRST AID PROCEDURES: PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO HYDROGEN FLUORIDE. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS.

INHALATION: Conscious persons should be moved to an uncontaminated area and given assisted respiration and supplemental oxygen. Keep the victim warm and quiet. Assure that mucous or vomited material does not obstruct the airway by positional drainage. Delayed pulmonary edema may occur. Keep patient under medical observation for at least 24 hours.

EYE CONTACT: PERSONS WITH POTENTIAL EXPOSURE TO HYDROGEN FLUORIDE SHOULD NOT WEAR CONTACT LENSES.

Flush contaminated eye(s) with copious quantities of water. Part eyelids to assure complete flushing. Continue for a minimum of 30 minutes.

SKIN CONTACT: Flush affected area with copious quantities of water. Remove affected clothing as rapidly as possible. Dermal burns may be treated with a calcium gluconate gel or slurry in water or glycerine. This compound binds the active fluorides in an insoluble form and limits burn extension and relieves pain.

PREPARATION INFORMATION

PREPARED BY: Safety Department

DATE PREPARED: 01/01/1999

LAST REVISION DATE: 05/21/2002