



Tel: 514-956-7503
Fax: 514-956-7504
Internet: www.megs.ca
Email : support@megs.ca

Montreal

St-Laurent

Tel : 514-956-7503

Fax : 514-956-7504

Ottawa

Nepean

Tel : 613-226-4228

Fax : 613-226-4229

Quebec

Quebec

Tel : 418-834-7447

Fax : 418-834-3774

MSDS: Fluorine

PRODUCT INFORMATION

PRODUCT: Fluorine

TRADE NAME: Fluorine

CHEMICAL NAME: Fluorine

SYNONYMS: None

FORMULA: F₂

CHEMICAL FAMILY: Halide

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: 38.00

PRODUCT USE: Various

PRODUCT IDENTIFICATION UN 1045

NUMBER:

HAZARDOUS INGREDIENTS

CHEMICAL ID	CONCENTRATION	CAS #	LD(50)	LC(50)
Fluorine	99+%	7782-41-4	None published	Inh-Rat 185 ppm/1 h

PHYSICAL DATA

PHYSICAL STATE: Gas under pressure

APPEARANCE: Pale, yellow gas with choking, ozone-like odor

ODOR: See above

ODOR THRESHOLD: Unknown

SPECIFIC GRAVITY (H₂O = 1): See Vapor Density (air = 1)

VAPOR PRESSURE: Not applicable (gas)

VAPOR DENSITY (air = 1): 1.31

EVAPORATION RATE: Not applicable (gas)
BOILING POINT: -188.1°C
FREEZING POINT: -219.6°C
pH: Acidic
GAS DENSITY: 1.608 kg/m³ @ 15°C, 101.3 kPa
COEFFICIENT OF WATER/OIL: Reacts violently with water (see
DISTRIBUTION: reactivity data).

FIRE OR EXPLOSION HAZARD

CONDITIONS OF FLAMMABILITY: Nonflammable gas

MEANS OF EXTINCTION: Nonflammable gas. However, fires with fluorine as the oxidizer can only be extinguished by shutting off the source of fluorine. Do not use water, chemicals, carbon dioxide or other extinguishing media as these will only add more fuel to the fire.

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: None

REACTIVITY DATA

CHEMICAL STABILITY: Stable as to decomposition. Highly reactive oxidizing agent. Heats of reactivity always high.

INCOMPATIBLE MATERIALS: Reacts violently or explosively on contact with water and most materials, particularly organics. Stainless steel, molybdenum, tungsten.

CONDITIONS OF REACTIVITY: See Incompatible Materials, above.

HAZARDOUS DECOMPOSITION PRODUCTS: Combustion products from a fire with fluorine as the oxidizer are generally toxic and reactive. They usually include hydrogen fluoride

and oxygen difluoride.

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.

SKIN ABSORPTION: None, principal route of entry is through inhalation.

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: Fluorine is irritating and corrosive to all living tissue. Toxic level exposure to dermal tissue causes hydrofluoric acid burns and skin lesions resulting in necrosis and scarring. Burns are progressive while any residual active fluorides remain. Chemical pneumonitis and pulmonary edema 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 fluorides may cause fluorosis, an abnormal calcification pattern of the skeletal system.

EXPOSURE LIMITS: TWA = 1 molar ppm; STEL = 2 molar ppm

IRRITANCY OF PRODUCT: Yes, to all living tissues

SENSITIZATION TO MATERIAL: None

CARCINOGENICITY, REPRODUCTIVE EFFECTS: None known

TERATOGENICITY, MUTAGENICITY: None known

TOXICOLOGICALLY SYNERGISTIC PRODUCTS: None known

PREVENTIVE MEASURES

PERSONAL PROTECTIVE EQUIPMENT: Plastic or rubber gloves. Safety goggles or glasses plus a face shield. Safety shoes, safety shower, eyewash "fountain" and protective apron (plastic or rubber). Positive air supply.

SPECIFIC ENGINEERING CONTROLS: Most metals form a passive fluoride film that protects the metal from further corrosion below approximately 204°C. Monel® and nickel are preferred for higher temperature applications. Teflon® is the preferred gasket material.

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: 2.3 (5.1)

WHMIS CLASSIFICATION: A, C, D1, 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 FLUORINE. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS.

INHALATION: Unconscious 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 use of positional drainage. Delayed pulmonary edema may occur. Keep patient under medical observation for at least 24 hours.

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

Flush contaminated eye(s) with copious quantities of water. Part eyelids with fingers 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: 05/21/2008

THE INFORMATION, RECOMMENDATIONS AND DATA CONTAINED IN THIS DOCUMENT ARE INTENDED TO BE USED BY PROPERLY TRAINED AND QUALIFIED PERSONNEL ONLY AND AT THEIR SOLE RISKS AND DISCRETION. THE INFORMATION, RECOMMENDATIONS AND DATA HEREIN CONTAINED ARE DERIVED FROM SOURCES WHICH WE BELIEVE TO BE RELIABLE. HOWEVER, MEGS INC. MAKES NO REPRESENTATION AND GIVES NO WARRANTY OF ANY KIND WHATSOEVER WITH RESPECT TO THEIR ACCURACY OR COMPLETENESS AND ASSUMES NO LIABILITY FOR DAMAGES OR LOSS ARISING DIRECTLY OR INDIRECTLY FROM THEIR USE, WHETHER PROPER OR IMPROPER.