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

Identification of the substance/preparation	:	50% Deoxo-Fluor™ in THF
Company	:	Air Products and Chemicals,Inc 7201 Hamilton Blvd. Allentown Postcode 18195-1501
Telephone	:	
Emergency telephone number	:	800-523-9374 USA 01-610-481-7711 International

2. COMPOSITION/INFORMATION ON INGREDIENTS

Components	EINECS / ELINCS	CAS Number	Concentration (Weight)	Classification
Tetrahydrofuran	203-726-8	109-99-9	50 %	F ; Xi R11 ; R19 ; R36/37
SULFUR, TRIFLUOR [2-METHOXY-N-(2-METHOXYETHYL) ETHANAMINATO-k N]-,(T-4)		202289-38-1	50 %	T ; E R35 ; R25 ; R 2 ; R14

Refer to section 16 for full text of each relevant R-phrase.

3. HAZARDS IDENTIFICATION

Classification

R25 Toxic if swallowed.
R34 Causes burns.
R20 Harmful by inhalation.
R11 Highly flammable.
R19 May form explosive peroxides.

Emergency Overview

Corrosive.
Keep away from heat and sources of ignition.
Components of the product may affect the nervous system.
Flammable.
Severe respiratory irritant.
Severe skin irritant.
Severe eye irritant.
Reacts violently with water.
Toxic if swallowed.

Potential Health Effects

Inhalation : Inhalation of aerosol may cause irritation to the upper respiratory tract. Risk of serious damage to the lungs (by inhalation). May cause nose, throat, and lung

irritation. Can cause severe eye, skin and respiratory tract burns. May cause central nervous system effects, such as headache, nausea, dizziness, confusion, breathing difficulties. Severe cases of overexposure can result in respiratory failure. Inhalation of vapors and/or aerosols in high concentration may cause irritation of respiratory system.

Eye contact	:	Causes eye burns. May cause blindness. Severe eye irritation.
Skin contact	:	Causes skin burns. If absorbed through the skin, may cause central nervous system effects, such as headache, nausea, dizziness, confusion, breathing difficulties.
Ingestion	:	If ingested, severe burns of the mouth and throat, as well as a danger of perforation of the oesophagus and the stomach. May cause central nervous system effects, such as headache, nausea, vomiting, abdominal pain, dizziness, confusion, breathing difficulties. Severe cases of overexposure can result in respiratory failure. May be fatal if swallowed. Toxic if swallowed.
Chronic Health Hazard	:	Prolonged contact may result in chemical burns and permanent damage. Repeated and/or prolonged exposures may result in: Muscular dysfunction.
Aggravated Medical Condition	:	Asthma. Eye disease Skin disorders and Allergies. Neurological disorders
Target Organs	:	Respiratory system. Skin. Eyes. Central nervous system.
Symptoms	:	Repeated and/or prolonged exposure to low concentrations of vapors and/or aerosols may cause: Sore throat. Irritating to eyes and respiratory system. Breathing difficulties. Symptoms may be delayed.

4. FIRST AID MEASURES

General advice	:	Prompt medical attention is required in all cases of overexposure. The potential for hydrogen fluoride formation exists with every exposure, therefore its toxicity must also be considered.
Eye contact	:	Hold eyelids apart, initiate and maintain gentle and continuous irrigation until the patient receives medical care. If medical care is not promptly available, continue to irrigate for one hour. Seek medical treatment immediately. Trained personnel should administer 1% calcium gluconate solution by continuous drip.
Skin contact	:	Immediately remove contaminated clothing, and any extraneous chemical, if possible to do so without delay. Initiate and maintain gentle and continuous irrigation until the patient receives medical care. If medical care is not promptly available, continue to irrigate for one hour. Cover wound with sterile dressing. With gloved hand apply 2.5% calcium gluconate gel to the burn area. Alternative treatment is to soak the affected areas in an iced 0.13% water solution (1:750) of Zephiran® chloride (benzalkonium chloride solution, NF). Use ice cubes, not shaved ice, to prevent frostbite. If soaking is impractical, soaks or compresses may be used. (Do not us Zephiran® for burns of the eye.) If immersion is impractical, soaked compresses of the same solution should be applied to the area. Immersion or compresses must be used

continuously for two hours. Burns covering an area greater than fifty-two square centimeters (8 square inches) require immediate treatment by a medical doctor.

Ingestion : If a person vomits when lying on his back, place him in the recovery position. Never give anything by mouth to an unconscious person. Do not induce vomiting.

Inhalation : If breathing has stopped or is labored, give assisted respirations. Supplemental oxygen may be indicated. If the heart has stopped, trained personnel should begin cardiopulmonary resuscitation immediately. A physician should be consulted for all exposures. Mouth to mouth resuscitation is not recommended. In case of shortness of breath, give oxygen. As soon as possible give 2.5% to 3% calcium gluconate solution by nebulizer.

Notes to physician

Treatment : If pain persists after above topical treatments, it may be necessary to inject 5% aqueous calcium gluconate beneath, around and into the burn area. This will more likely be necessary in the treatment of extensive burns or small burns where treatment has been delayed. Do not use local anesthetics. Resolution of pain is means to determine effective medical treatment. The patient should be observed for clinical symptoms of hypocalcemia following ingestion or inhalation or following extensive burns. Serum calcium, potassium and magnesium determinations must be performed immediately and periodically to monitor for hypocalcemia and electrolyte imbalance. EKGs should be done immediately and periodically to monitor for arrhythmias, hypocalcemia and hyperkalemia. If additional information is needed call the Air Products' Emergency Number (Section 1) or consult the Air Products' Safetygram 29 "Treatment Protocol for Hydrofluoric Acid Burns."

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media : For smaller fires, use dry chemical or carbon dioxide, do not use water. For large fires, flood fire area with water from as far as possible, using a protective barrier and appropriate personal protective equipment.

Extinguishing media which must not be used for safety reasons : Water.
Alcohol-resistant foam.

Specific hazards : Incomplete combustion may form carbon monoxide. Fire or intense heat may cause violent rupture of packages. Flash back possible over considerable distance. May form explosive mixtures in air. Downwind personnel must be evacuated. Burning produces obnoxious and toxic fumes. Reacts violently with water.

Special protective equipment for fire-fighters : Avoid contact with the skin. A face shield should be worn.

Further information : Do not allow run-off from fire fighting to enter drains or water courses.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions : Use self-contained breathing apparatus and chemically protective clothing. Wear suitable protective clothing, gloves and eye/face protection. Remove all sources of ignition.

Environmental precautions : Shut off or remove all ignition sources. Construct a dike to prevent spreading. Prevent spilled product from entering streams or drinking water supplies. Local

authorities should be advised if significant spillages cannot be contained.

Methods for cleaning up	:	Approach suspected leak areas with caution. Contact Air Products' Emergency Response Center for advice. Absorb with inert absorbent materials such as: Dry sand. Vermiculite. Activated charcoal. Polypropylene.
Additional advice	:	Open enclosed spaces to outside atmosphere. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous. Protect from water.

7. HANDLING AND STORAGE

Handling

Avoid contact with skin and eyes. Use only in well-ventilated areas. Avoid breathing vapors and/or aerosols. Emergency showers and eye wash stations should be readily accessible. Adhere to work practice rules established by government regulations. Avoid contact with eyes.

Storage

To avoid ignition of vapors by static electricity discharge, all metal parts of the equipment must be grounded. Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from heat and sources of ignition. Keep in a dry, cool place. Keep away from Oxidizers. Store in an area suitable for water reactive materials. Minimize exposure to air. Exposure may cause material to degrade. Store under a nitrogen atmosphere.

Technical measures/Precautions

Keep away from open flames, hot surfaces and sources of ignition.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering measures

Use explosion-proof equipment.

Personal protective equipment

Respiratory protection	:	Wear appropriate respirator when ventilation is inadequate. Use Air Purifying Respirator with organic vapor cartridges when exposure is likely.
Hand protection	:	Polyvinyl Alcohol Gloves (PVA). Nitrile rubber. Impervious gloves.
Eye protection	:	Full face shield with goggles underneath. Chemical resistant goggles must be worn.
Skin and body protection	:	Impervious clothing. Full rubber suit (rain gear). Rubber or plastic boots. Long sleeve shirts and trousers without cuffs.
Environmental exposure controls	:	Shut off or remove all ignition sources. Construct a dike to prevent spreading. Prevent spilled product from entering streams or drinking water supplies. Local authorities should be advised if significant spillages cannot be contained.
Special instructions for	:	Provide readily accessible eye wash stations and safety showers. Wash at the

protection and hygiene end of each workshift and before eating, smoking or using the toilet.

Exposure limit(s)

Tetrahydrofuran	Time Weighted Average (TWA): EU ELV	50 ppm	150 mg/m3
Tetrahydrofuran	Short Term Exposure Limit (STEL): EU ELV	100 ppm	300 mg/m3

9. PHYSICAL AND CHEMICAL PROPERTIES

Color	:	Yellow.
Molecular Weight	:	108.7 g/mol
Relative density	:	0.85 (water = 1)
Vapor pressure	:	106.02 mmHg
Density	:	53.064 lb/ft3 (0.85 g/cm3) at
Flash point	:	-17 °C
Autoignition temperature	:	321 °C
Upper flammability limit	:	11 %(V)
Lower flammability limit	:	2 %(V)
Water solubility	:	Reacts violently with water. Reacts violently with water.

10. STABILITY AND REACTIVITY

Conditions to avoid	:	Heat, flames and sparks. Exposure to moisture.
Materials to avoid	:	Oxidizing agents. Humid air. Water. Alcohols. Reacts energetically with water. Reaction with water or contaminants or excessive heat may result in sufficient pressure to burst container.
Hazardous decomposition products	:	Carbon monoxide. Carbon dioxide (CO2).
Hazardous reactions	:	Reacts violently with water. May form explosive peroxides., Reacts violently with water.

11. TOXICOLOGICAL INFORMATION

Acute Health Hazard

Ingestion : No data is available on the product itself.

Ingestion - Components

Tetrahydrofuran	LD50 : 1,650 mg/kg	Species : Rat.

SULFUR, TRIFLUOR [2-METHOXY-N-(2-METHOXYETHYL) ETHANAMINATO-k N]-,(T-4)	LD50 : > 50 - < 200 mg/kg	Species : Rat.

Inhalation : No data is available on the product itself.

Skin. : No data is available on the product itself.

Eye irritation/corrosion : Severe eye irritation.

Acute dermal irritation/corrosion : Severe skin irritation.

12. ECOLOGICAL INFORMATION

Ecotoxicity effects

Aquatic toxicity : No data is available on the product itself.

Toxicity to fish - Components

Tetrahydrofuran	LC50 (96 h) : 2,160 mg/l	Species : Fathead minnow (Pimephales promelas).

Toxicity to other organisms : No data available.

Persistence and degradability

Mobility : No data available.

Bioaccumulation : No data is available on the product itself.

Bioaccumulation - Components

Tetrahydrofuran	Negligible bioaccumulation potential.

13. DISPOSAL CONSIDERATIONS

Waste from residues / unused products : Ensure all national/local regulations are observed. Contact supplier if guidance is required.

14. TRANSPORT INFORMATION

ADR

Proper shipping name : FLAMMABLE LIQUID, TOXIC, CORROSIVE, N.O.S. (Bis(2-Methoxyethyl) Aminosulfur Trifluoride, Tetrahydrofuran (thf))
Class : 3 (6.1, 8)
UN/ID No. : UN3286
Packing group : II
ADR/RID Hazard ID no. : 368

IATA

Proper shipping name : Flammable liquid, toxic, corrosive, n.o.s. (Bis(2-Methoxyethyl) Aminosulfur Trifluoride, Tetrahydrofuran (thf))

Class : 3 (6.1, 8)
UN/ID No. : UN3286
Packing group : II

IMDG

Proper shipping name : FLAMMABLE LIQUID, TOXIC, CORROSIVE, N.O.S. (Bis(2-Methoxyethyl) Aminosulfur Trifluoride, Tetrahydrofuran (thf))
Class : 3 (6.1, 8)
UN/ID No. : UN3286
Packing group : II

RID

Proper shipping name : FLAMMABLE LIQUID, TOXIC, CORROSIVE, N.O.S. (Bis(2-Methoxyethyl) Aminosulfur Trifluoride, Tetrahydrofuran (thf))
Class : 3 (6.1, 8)
UN/ID No. : UN3286
Packing group : II

15. REGULATORY INFORMATION

Labelling according to EEC Directive

Hazard symbol : T Toxic
F Highly flammable
C Corrosive.

R-phrase(s) : R25 Toxic if swallowed.
R34 Causes burns.
R20 Harmful by inhalation.
R11 Highly flammable.
R19 May form explosive peroxides.

S-phrase(s) : S16 Keep away from sources of ignition. - No smoking.
S23 Do not breathe vapor.
S 7/8 Keep container tightly closed and dry.
S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S33 Take precautionary measures against static discharges.
S36/37/39 Wear suitable protective clothing, gloves and eye/face protection.
S62 If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label.

Country	Regulatory list	Notification
USA	TSCA	Included on Inventory.
EU	EINECS	Not on Inventory.
Canada	DSL	Not on Inventory.
Australia	AICS	Not on Inventory.
Japan	ENCS	Not on Inventory.
South Korea	ECL	Not on Inventory.
China	SEPA	Included on Inventory.
Philippines	PICCS	Not on Inventory.

16. OTHER INFORMATION

Ensure all national/local regulations are observed.

R-phrase(s) - Components

R11 Highly flammable.
R19 May form explosive peroxides.
R36/37 Irritating to eyes and respiratory system.
R35 Causes severe burns.
R25 Toxic if swallowed.
R 2 Risk of explosion by shock, friction, fire or other sources of ignition.
R14 Reacts violently with water.

Prepared by : Air Products and Chemicals, Inc. Global EH&S Product Safety Department

For additional information, please visit our Product Stewardship web site at
http://www.airproducts.com/productstewardship/

This Safety Data Sheet has been established in accordance with the applicable European Directives and applies to all countries that have translated the Directives in their national laws.