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MSDS: Nitrogen Trifluoride

PRODUCT INFORMATION

PRODUCT: Nitrogen Trifluoride
TRADE NAME: Nitrogen Trifluoride
CHEMICAL NAME: Nitrogen Trifluoride
SYNONYMS: Nitrogen Fluoride
FORMULA: NF_3
CHEMICAL FAMILY: Inorganic Fluoride
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: 71.01
PRODUCT USE: Various
**PRODUCT IDENTIFICATION UN 2451
NUMBER:**

HAZARDOUS INGREDIENTS

CHEMICAL ID	CONCENTRATION	CAS #	LD(50)	LC(50)
Nitrogen Trifluoride	100%	7783-54-2	None	1h1-Rat 6700 ppm/1h

PHYSICAL DATA

PHYSICAL STATE: Gas under pressure
APPEARANCE: Colorless gas
ODOR: Odorless
ODOR THRESHOLD: Not applicable
SPECIFIC GRAVITY (H₂O = 1): See Vapor Density (air = 1)
VAPOR PRESSURE: Not applicable (gas)

VAPOR DENSITY (air = 1): 2.46
EVAPORATION RATE: Not applicable (gas)
BOILING POINT: -129°C
FREEZING POINT: -206.79°C
pH: Not applicable
GAS DENSITY: 3.03 kg/m³ @ 15°C, 101.3 kPa
COEFFICIENT OF WATER/OIL Slightly soluble in water
DISTRIBUTION:

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: None

REACTIVITY DATA

CHEMICAL STABILITY: Stable
INCOMPATIBLE MATERIALS: Carbon monoxide, ammonia, H₂, H₂S and CH₄
CONDITIONS OF REACTIVITY: Open flames and elevated (>260°C) temperature.
HAZARDOUS DECOMPOSITION PRODUCTS: Tetrafluorohydrazine (N₂F₄) and other active fluoride radicals

TOXICOLOGICAL PROPERTIES

ROUTES OF ENTRY:

SKIN CONTACT: None

SKIN ABSORPTION: None known

EYE: None

INHALATION: Symptoms include headache, weakness, dizziness, confusion and other manifestations associated with a reduced oxygen supply in the blood.

INGESTION: None

ACUTE OVER EXPOSURE EFFECTS: The toxicity of nitrogen trifluoride is related to its capacity to form methemoglobin, a modified form of hemoglobin incapable of transporting oxygen, and its ability to destroy red blood cells (hemolysis). Upon cessation of exposure, methemoglobin spontaneously reverts to hemoglobin. However, at high levels of conversion, therapeutic intervention may be indicated (oxygen, methylene blue, exchange transfusion). The occurrence of hemolysis requires careful monitoring for degree of anemia and the potential for impaired kidney function.

CHRONIC OVER EXPOSURE EFFECTS: None recognized

EXPOSURE LIMITS: TWA = 10 molar ppm (ACGIH 1995-1996)

IRRITANCY OF PRODUCT: None

SENSITIZATION TO MATERIAL: None

CARCINOGENICITY, REPRODUCTIVE EFFECTS: None known

TERATOGENICITY, MUTAGENICITY: None known

TOXICOLOGICALLY SYNERGISTIC PRODUCTS: None known

PREVENTIVE MEASURES

PERSONAL PROTECTIVE EQUIPMENT: Gloves. Safety goggles or glasses. Safety shoes.

SPECIFIC ENGINEERING CONTROLS: Most metals are satisfactory for handling nitrogen trifluoride up to temperatures of approximately 70°C. Nickel and Monel® are recommended for higher temperatures. Wetted surfaces should be passivated with an "active" fluorine compound to establish a metal fluoride coating as additional protection. Teflon® and Kel-F® are the preferred gasket materials. Refer to Liquid Air's Gas Encyclopedia for a complete listing.

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. Do not tamper with (valve) safety device. 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

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 NITROGEN TRIFLUORIDE. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS.

An individual exposed to nitrogen trifluoride should be removed from the contaminated area as quickly as possible. If there is evidence of chemical cyanosis, administer oxygen. Headache or other symptoms may also be alleviated by oxygen. Seek medical assistance promptly.

Note to the physician: Human data on nitrogen trifluoride is limited. Methemoglobin production and hemolysis are nonspecific effects which require monitoring and appropriate supportive measures. Close observation for pulmonary and renal impairment is recommended.

INHALATION: See above

EYE CONTACT: Part eyelids & flush eyes with copious quantities of lukewarm water

SKIN CONTACT: Not applicable

PREPARATION INFORMATION

PREPARED BY: Safety Department

DATE PREPARED: 09/01/1999

LAST REVISION DATE: 05/21/2002

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