MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

SPECIALTY CHEMICAL PRODUCTS
1407 Pennsylvania Ave.
South Houston, Texas 77587
713-944-0900

Emergency Contact:
CHEMTREC 1-800-424-9300
Calls Originating Outside the US: Information:
703-527-3887 (Collect Calls Accepted)

SUBSTANCE: NITROGEN TRIFLUORIDE

TRADE NAMES/SYNONYMS:
NITROGEN FLUORIDE (NF3); PERFLUOROAMMONIA; TRIFLUORAMINE; TRIFLUORAMMONIA; TRIFLUORAMINE; TRIFLUORAMMONIA; UN 2451; F3N; 00232339; RTECS QX1925000

CHEMICAL FAMILY: halogens
CREATION DATE: Dec 18 2006
REVISION DATE: Dec 11 2008

2. COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: NITROGEN TRIFLUORIDE
CAS NUMBER: 7783-54-2
PERCENTAGE: 100.0

3. HAZARDS IDENTIFICATION

NFPA RATINGS (SCALE 0-4):
HEALTH=2 FIRE=0 REACTIVITY=0

EMERGENCY OVERVIEW:
COLOR: colorless
PHYSICAL FORM: gas
ODOR: damp, moldy odor
MAJOR HEALTH HAZARDS: blood damage
PHYSICAL HAZARDS: Containers may rupture or explode if exposed to heat. Strong oxidizer. Contact with combustible material may cause fire.
POTENTIAL HEALTH EFFECTS:

INHALATION:
SHORT TERM EXPOSURE: same as effects reported in short term ingestion, irritation (possibly severe), nausea, vomiting, difficulty breathing, asthma, irregular heartbeat, headache, drowsiness, dizziness, bluish skin color, lung congestion, convulsions, coma
LONG TERM EXPOSURE: same as effects reported in short term exposure

SKIN CONTACT:
SHORT TERM EXPOSURE: same as effects reported in short term ingestion, irritation (possibly severe)
LONG TERM EXPOSURE: same as effects reported in short term exposure

EYE CONTACT:
SHORT TERM EXPOSURE: irritation (possibly severe)
LONG TERM EXPOSURE: same as effects reported in short term exposure

INGESTION:
SHORT TERM EXPOSURE: burns, rash, nausea, diarrhea, stomach pain, difficulty breathing, irregular heartbeat, headache, tingling sensation, visual disturbances, dilated pupils, bluish skin color, paralysis, convulsions, coma
LONG TERM EXPOSURE: no information on significant adverse effects

4. FIRST AID MEASURES

INHALATION: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.

SKIN CONTACT: Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get immediate medical attention. Thoroughly clean and dry contaminated clothing before reuse. Destroy contaminated shoes.

EYE CONTACT: Immediately flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

INGESTION: If a large amount is swallowed, get medical attention.

ANTIDOTE: methylene blue, intravenous; ascorbic acid, intravenous.

NOTE TO PHYSICIAN: For inhalation, consider oxygen.
5. FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS: Negligible fire hazard. Oxidizer. May ignite or explode on contact with combustible materials.

EXTINGUISHING MEDIA: carbon dioxide, regular dry chemical Large fires: Use regular foam or flood with fine water spray.

FIRE FIGHTING: Do not get water inside container. Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. Keep unnecessary people away, isolate hazard area and deny entry. Use extinguishing agents appropriate for surrounding fire. Flood with fine water spray. Cool containers with water spray until well after the fire is out. Apply water from a protected location or from a safe distance. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas. Consider downwind evacuation if material is leaking.

6. ACCIDENTAL RELEASE MEASURES

OCCUPATIONAL RELEASE:

7. HANDLING AND STORAGE


8. EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS: NITROGEN TRIFLUORIDE:
10 ppm (29 mg/m3) OSHA TWA 10 ppm ACGIH TWA 10 ppm (29 mg/m3) NIOSH recommended TWA 10 hour(s)

VENTILATION: Provide local exhaust ventilation system. Provide local exhaust ventilation system. Ensure compliance with applicable exposure limits.

EYE PROTECTION: Wear splash resistant safety goggles with a faceshield. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

CLOTHING: Wear appropriate chemical resistant clothing.

GLOVES: Wear appropriate chemical resistant gloves.

RESPIRATOR: The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA.
100 ppm
Any air-purifying half-mask respirator equipped with cartridge(s) providing protection against the compound of concern. Any supplied-air respirator.

250 ppm
Any supplied-air respirator operated in a continuous-flow mode. Any powered, air-purifying respirator with cartridge(s) providing protection against this substance.

500 ppm
Any air-purifying respirator with a full facepiece and a canister providing protection against this substance. Any air-purifying full-facepiece respirator (gas mask) with a chin-style, front-mounted or back-mounted canister providing protection against the compound of concern. Any powered, air-purifying respirator with a tight-fitting facepiece and cartridge(s) providing protection against this substance. Any supplied-air respirator with a tight-fitting facepiece that is operated in a continuous-flow mode. Any self-contained breathing apparatus with a full facepiece. Any supplied-air respirator with a full facepiece.

1000 ppm
Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode. Emergency or planned entry into unknown concentrations or IDLH conditions - Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode. Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.

Escape
Any air-purifying full-facepiece respirator (gas mask) with a chin-style, front-mounted or back-mounted canister providing protection against the compound of concern. Any appropriate escape-type, self-contained breathing apparatus.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: gas
COLOR: colorless
ODOR: damp, moldy odor
MOLECULAR WEIGHT: 71.00
MOLECULAR FORMULA: F3-N
BOILING POINT: -200 to -184 F (-129 to -120 C)
FREEZING POINT: -359 to -341 F (-217 to -207 C)
VAPOR PRESSURE: 1500 mmHg @ -119 C
VAPOR DENSITY (air=1): 2.46
SPECIFIC GRAVITY: Not applicable
DENSITY: 2.96 g/L @ 20 C
PH: Not applicable
VOLATILITY: Not applicable
WATER SOLUBILITY: slightly soluble
ODOR THRESHOLD: Not available
EVAPORATION RATE: Not applicable
VISCOITY: 0.018 cP @ 25 C
COEFFICIENT OF WATER/OIL DISTRIBUTION: Not applicable
10. STABILITY AND REACTIVITY

REACTIVITY: Stable at normal temperatures and pressure.

CONDITIONS TO AVOID: Minimize contact with material. Avoid inhalation of material or combustion by-products. Containers may rupture or explode if exposed to heat.

INCOMPATIBILITIES: combustible materials, bases, reducing agents, metals

HAZARDOUS DECOMPOSITION: Thermal decomposition products: halogenated compounds

POLYMERIZATION: Will not polymerize.

11. TOXICOLOGICAL INFORMATION

NITROGEN TRIFLUORIDE:
TOXICITY DATA: 6700 ppm/1 hour(s) inhalation-rat LC50
ACUTE TOXICITY LEVEL: Toxic: inhalation
TARGET ORGANS: blood

12. ECOLOGICAL INFORMATION
Not available

13. DISPOSAL CONSIDERATIONS
Dispose in accordance with all applicable regulations. Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D001.

14. TRANSPORT INFORMATION

U.S. DOT 49 CFR 172.101:
PROPER SHIPPING NAME: Nitrogen trifluoride
ID NUMBER: UN2451
HAZARD CLASS OR DIVISION: 2.2
LABELING REQUIREMENTS: 2.2; 5.1

CANADIAN TRANSPORTATION OF DANGEROUS GOODS:
SHIPPING NAME: Nitrogen trifluoride, compressed
UN NUMBER: UN2451
CLASS: 2.2; 5.1
15. REGULATORY INFORMATION

**U.S. REGULATIONS:**

CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4):
Not regulated.

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355 Subpart B):
Not regulated.

SARA TITLE III SECTION 304 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355 Subpart C):
Not regulated.

SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370 Subparts B and C):
ACUTE: Yes
CHRONIC: No
FIRE: No
REACTIVE: No
SUDDEN RELEASE: Yes

SARA TITLE III SECTION 313 (40 CFR 372.65):
Not regulated.

OSHA PROCESS SAFETY (29 CFR 1910.119):
NITROGEN TRIFLUORIDE: 5000 LBS TQ

**STATE REGULATIONS:**
California Proposition 65: Not regulated.

**CANADIAN REGULATIONS:**
WHMIS CLASSIFICATION: Not determined.

**NATIONAL INVENTORY STATUS:**

U.S. INVENTORY (TSCA): Listed on inventory.
TSCA 12(b) EXPORT NOTIFICATION: Not listed.
CANADA INVENTORY (DSL/NDSEL): Not determined.
16. OTHER INFORMATION

**MSDS SUMMARY OF CHANGES**

15. REGULATORY INFORMATION
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