MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATHESON TRI-GAS, INC.                        Emergency Contact:
150 Allen Road Suite 302                       CHEMTREC 1-800-424-9300
Basking Ridge, New Jersey 07920               Calls Originating Outside the US:
Information: 1-800-416-2505                    703-527-3887 (Collect Calls Accepted)

SUBSTANCE: METHOXYFLURANE

TRADE NAMES/SYNONYMS:
ETHANE, 2,2-DICHLORO-1,1-DIFLUORO-1-METHOXY; ETHER, 2,2-DICHLORO-1,1-DIFLUOROETHYL METHYL; 2,2-DICHLORO-1,1-DIFLUOROETHYL METHYL ETHER; 2,2-DICHLORO-1,1-DIFLUORO-1-METHOXY ETHANE; METHOFLURANE; METHOXANE; METOXFLURAN; C3H4Cl2F2O; MAT14223; RTECS KN7820000

CHEMICAL FAMILY: ethers, aliphatic, halogens

CREATION DATE: Feb 16 1989
REVISION DATE: Dec 11 2008

2. COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: METHOXYFLURANE
CAS NUMBER: 76-38-0
PERCENTAGE: 100.0

3. HAZARDS IDENTIFICATION

NFPA RATINGS (SCALE 0-4): HEALTH=4  FIRE=3  REACTIVITY=0

EMERGENCY OVERVIEW:
COLOR: colorless
PHYSICAL FORM: liquid
ODOR: fruity odor

MAJOR HEALTH HAZARDS: skin irritation, eye irritation, central nervous system depression, kidney damage

PHYSICAL HAZARDS: Flammable liquid and vapor. Vapor may cause flash fire.

POTENTIAL HEALTH EFFECTS:
INHALATION:
SHORT TERM EXPOSURE: nausea, vomiting, irregular heartbeat, headache, symptoms of drunkenness, bluish skin color, kidney damage, liver damage
LONG TERM EXPOSURE: sterility, kidney damage, liver damage, reproductive effects

SKIN CONTACT:
SHORT TERM EXPOSURE: irritation
LONG TERM EXPOSURE: same as effects reported in short term exposure

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

INGESTION:
SHORT TERM EXPOSURE: same as effects reported in short term inhalation
LONG TERM EXPOSURE: no information is available

4. FIRST AID MEASURES

INHALATION: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. Get immediate medical attention.

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

EYE CONTACT: 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.

5. FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS: Severe fire hazard. Vapor/air mixtures are explosive above flash point.

EXTINGUISHING MEDIA: regular dry chemical, carbon dioxide, water, regular foam

Large fires: Use regular foam or flood with fine water spray.

FIRE FIGHTING: Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Do not attempt to extinguish fire unless flow of material can be stopped first. Flood with fine water spray. Do not scatter spilled material with high-pressure water streams. 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.
6. ACCIDENTAL RELEASE MEASURES

OCCUPATIONAL RELEASE:
Avoid heat, flames, sparks and other sources of ignition. Stop leak if possible without personal risk. Reduce vapors with water spray. Small spills: Absorb with sand or other non-combustible material. Collect spilled material in appropriate container for disposal. Large spills: Dike for later disposal. Remove sources of ignition. Keep unnecessary people away, isolate hazard area and deny entry.

7. HANDLING AND STORAGE


8. EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS:
METHOXYFLURANE:
2 ppm (13.5 mg/m³) NIOSH ceiling 60 minute(s) (waste anesthetic gas)

VENTILATION: Ventilation equipment should be explosion-resistant if explosive concentrations of material are present. Provide local exhaust or process enclosure 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: Under conditions of frequent use or heavy exposure, respiratory protection may be needed. Respiratory protection is ranked in order from minimum to maximum. Consider warning properties before use.
Any chemical cartridge respirator with organic vapor cartridge(s).
Any chemical cartridge respirator with a full facepiece and organic vapor cartridge(s).
Any air-purifying respirator with a full facepiece and an organic vapor canister.
For Unknown Concentrations or Immediately Dangerous to Life or Health -
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. 
Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: liquid
APPEARANCE: clear
COLOR: colorless
ODOR: fruity odor
MOLECULAR WEIGHT: 164.97
MOLECULAR FORMULA: C-H3-O-C-F2-C-H-CL2
BOILING POINT: 219-221 F (104-105 C)
FREEZING POINT: -35 to -31 F (-37 to -35 C)
VAPOR PRESSURE: Not available
VAPOR DENSITY: Not available
SPECIFIC GRAVITY (water=1): 1.4223
WATER SOLUBILITY: slightly soluble
PH: Not available
VOLATILITY: Not available
ODOR THRESHOLD: Not available
EVAPORATION RATE: Not available
COEFFICIENT OF WATER/OIL DISTRIBUTION: Not available
SOLVENT SOLUBILITY:
Soluble: olive oil, chloroform, ethanol, acetone, benzene

10. STABILITY AND REACTIVITY

REACTIVITY: Stable at normal temperatures and pressure.

CONDITIONS TO AVOID: Avoid heat, flames, sparks and other sources of ignition. Containers may rupture or explode if exposed to heat. Keep out of water supplies and sewers.

INCOMPATIBILITIES: oxidizing materials, halo carbons

HAZARDOUS DECOMPOSITION:
Thermal decomposition products: halogenated compounds, oxides of carbon

POLYMERIZATION: Will not polymerize.

11. TOXICOLOGICAL INFORMATION
METHOXYFLURANE:
IRRITATION DATA: 100 mg eyes-rabbit moderate
TOXICITY DATA: 33500 mg/m3/4 hour(s) inhalation-rat LC50; 3.6 mg/kg oral-rat LD50
CARCINOGEN STATUS: IARC: Human Inadequate Evidence, Animal Inadequate Evidence, Group 3
LOCAL EFFECTS:
Irritant: skin, eye
ACUTE TOXICITY LEVEL:
Highly Toxic: ingestion
Slightly Toxic: inhalation
TARGET ORGANS: central nervous system, kidneys
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: diabetes, kidney disorders
MUTAGENIC DATA: Available.
REPRODUCTIVE EFFECTS DATA: Available.
ADDITIONAL DATA: Interactions with drugs may occur. Stimulants such as epinephrine may induce ventricular fibrillation. May cross react with similar compounds.

12. ECOLOGICAL INFORMATION

Not available

13. DISPOSAL CONSIDERATIONS

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: Flammable liquids, n.o.s. (METHOXYFLURANE)
ID NUMBER: UN1993
HAZARD CLASS OR DIVISION: 3
PACKING GROUP: III
LABELING REQUIREMENTS: 3

CANADIAN TRANSPORTATION OF DANGEROUS GOODS:
SHIPPING NAME: Flammable liquid, n.o.s. (METHOXYFLURANE)
UN NUMBER: UN1993
CLASS: 3
PACKING GROUP/CATEGORY: III

15. REGULATORY INFORMATION
U.S. REGULATIONS:
CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4): Not regulated.


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


STATE REGULATIONS:
California Proposition 65: Not regulated.

CANADIAN REGULATIONS:
WHMIS CLASSIFICATION: Not determined.

NATIONAL INVENTORY STATUS:
U.S. INVENTORY (TSCA): Not listed on inventory.

TSCA 12(b) EXPORT NOTIFICATION: Not listed.

CANADA INVENTORY (DSL/NDSL): Not determined.

16. OTHER INFORMATION

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