

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATHESON TRI-GAS, INC.
150 Allen Road Suite 302
Basking Ridge, New Jersey 07920
Information: 1-800-416-2505

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

SUBSTANCE: HYDROGEN FLUORIDE

TRADE NAMES/SYNONYMS:

MTG MSDS 52; HYDROFLUORIC ACID; FLUORHYDRIC ACID; ANHYDROUS HYDROFLUORIC ACID; HYDROFLUORIC ACID GAS; HYDROGEN FLUORIDE, ANHYDROUS; UN 1052; FH; MAT11170; RTECS MW7875000

CHEMICAL FAMILY: acids, inorganic

PRODUCT USE: industrial

CREATION DATE: Jan 24 1989

REVISION DATE: Dec 11 2008

2. COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: HYDROGEN FLUORIDE

CAS NUMBER: 7664-39-3

PERCENTAGE: 100.0

3. HAZARDS IDENTIFICATION

NFPA RATINGS (SCALE 0-4): HEALTH=3 FIRE=0 REACTIVITY=2

EMERGENCY OVERVIEW:

COLOR: colorless

PHYSICAL FORM: gas

ODOR: irritating odor, pungent odor

MAJOR HEALTH HAZARDS: harmful if inhaled, respiratory tract burns, skin burns, eye burns, mucous membrane burns

PHYSICAL HAZARDS: May react on contact with water.



POTENTIAL HEALTH EFFECTS:

INHALATION:

SHORT TERM EXPOSURE: burns

LONG TERM EXPOSURE: burns, fluorosis, kidney damage, liver damage

SKIN CONTACT:

SHORT TERM EXPOSURE: burns, absorption may occur

LONG TERM EXPOSURE: burns, fluorosis

EYE CONTACT:

SHORT TERM EXPOSURE: burns

LONG TERM EXPOSURE: burns

INGESTION:

SHORT TERM EXPOSURE: burns

LONG TERM EXPOSURE: burns

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: Remove contaminated clothing, jewelry and shoes. Rinse with water. Thoroughly clean and dry contaminated clothing before reuse. Get medical attention.

EYE CONTACT: Immediately flush eyes with plenty of water for at least 15 minutes. Remove any contact lenses to ensure thorough flushing. Get immediate medical attention.

INGESTION: If swallowed, do not induce vomiting. Rinse mouth out with water. Get immediate medical attention.

NOTE TO PHYSICIAN: For inhalation, consider oxygen. For skin contact, consider ice water bath, iced alcohol, iced magnesium sulfate, magnesium oxide/glycerin gels, calcium gluconate gel or benzalkonium chloride solution. Avoid gastric lavage or emesis.

5. FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS: Negligible fire hazard.

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. Stay away from the ends of tanks. Use extinguishing agents appropriate for surrounding fire. Flood with fine water spray. Avoid inhalation of material or combustion by-products.

Stay upwind and keep out of low areas.

FIRE FIGHTING PROTECTIVE EQUIPMENT: Wear full protective fire fighting gear including self contained breathing apparatus (SCBA) for protection against possible exposure.

FLASH POINT: not flammable

LOWER FLAMMABLE LIMIT: Not applicable

UPPER FLAMMABLE LIMIT: Not applicable

AUTOIGNITION: Not applicable

HAZARDOUS COMBUSTION PRODUCTS:

Thermal decomposition or combustion products: halogenated compounds, hydrogen

6. ACCIDENTAL RELEASE MEASURES

AIR RELEASE:

Reduce vapors with water spray. Collect runoff for disposal as potential hazardous waste.

SOIL RELEASE:

Dig holding area such as lagoon, pond or pit for containment. Dike for later disposal. Absorb with sand or other non-combustible material. Add an alkaline material (lime, crushed limestone, sodium bicarbonate, or soda ash).

WATER RELEASE:

Add an alkaline material (lime, crushed limestone, sodium bicarbonate, or soda ash). Neutralize. Collect spilled material using mechanical equipment.

OCCUPATIONAL RELEASE:

Do not touch spilled material. 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. Keep unnecessary people away, isolate hazard area and deny entry. Notify Local Emergency Planning Committee and State Emergency Response Commission for release greater than or equal to RQ (U.S. SARA Section 304). If release occurs in the U.S. and is reportable under CERCLA Section 103, notify the National Response Center at (800)424-8802 (USA) or (202)426-2675 (USA).

7. HANDLING AND STORAGE

STORAGE: Store and handle in accordance with all current regulations and standards. Protect from physical damage. Store in a well-ventilated area. Keep separated from incompatible substances. Notify State Emergency Response Commission for storage or use at amounts greater than or equal to the TPQ (U.S. EPA SARA Section 302). SARA Section 303 requires facilities storing a material with a TPQ to participate in local emergency response planning (U.S. EPA 40 CFR 355 Part B). Subject to storage regulations: U.S. OSHA 29 CFR 1910.101. Store in a cool, dry place. There is a potential over-pressure hazard with long term

storage of carbon steel containers and Hydrogen Fluoride. Hydrogen Fluoride in the carbon steel container reacts very slowly with the iron in the steel to form iron fluoride and hydrogen which builds pressure within the container. Hydrogen Fluoride in carbon steel containers should not be stored for extended periods of time (recommend less than two years). Extreme caution should be taken during the handling of any carbon steel containers storing Hydrogen Fluoride that have been stored for extended periods of time. Protect from sunlight. Keep container tightly closed. Store in a secure area.

HANDLING: Do not breathe vapor or mist. Use only with adequate ventilation. Wash thoroughly after handling. Protective clothing, gloves, and/or safety goggles may be necessary. When using, do not eat, drink or smoke.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS:

HYDROGEN FLUORIDE:

HYDROGEN FLUORIDE, (as F):

3 ppm OSHA TWA

6 ppm OSHA STEL (vacated by 58 FR 35338, June 30, 1993)

2 ppm ACGIH ceiling

0.5 ppm ACGIH TWA

3 ppm (2.5 mg/m³) NIOSH recommended TWA 10 hour(s)

6 ppm (5 mg/m³) NIOSH recommended ceiling 15 minute(s)

VENTILATION: 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.

PROTECTIVE MATERIAL TYPES: neoprene, polyvinyl chloride (PVC), polyethylene

RESPIRATOR: The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA.

Measurement Element:

F

30 ppm

Any air-purifying half-mask respirator equipped with cartridge(s) providing protection against the compound of concern.

Any powered, air-purifying respirator with cartridge(s) 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 supplied-air respirator.

Any self-contained breathing apparatus with a full facepiece.

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: liquid

COLOR: colorless

PHYSICAL FORM: gas

ODOR: irritating odor, pungent odor

MOLECULAR WEIGHT: 20.01

MOLECULAR FORMULA: H-F

BOILING POINT: 68 F (20 C)

FREEZING POINT: -117 F (-83 C)

DECOMPOSITION POINT: Not available

VAPOR PRESSURE: 760 mmHg @ 20 C

VAPOR DENSITY (air=1): 0.7

SPECIFIC GRAVITY (water=1): 0.987-0.991

WATER SOLUBILITY: reacts violently

PH: acidic in solution

VOLATILITY: 100%

ODOR THRESHOLD: 0.03-0.11 mg/m³

EVAPORATION RATE: Not available

VISCOSITY: 0.256 cP @ 0 C (liquid)

COEFFICIENT OF WATER/OIL DISTRIBUTION: Not available

SOLVENT SOLUBILITY:

Soluble: alcohol, organic solvents

Slightly Soluble: ether, benzene, toluene, m-xylene, tetrahydronaphthalene

10. STABILITY AND REACTIVITY

REACTIVITY: May react with evolution of heat on contact with water. Releases toxic, corrosive, flammable or explosive gases.

CONDITIONS TO AVOID: Avoid heat, flames, sparks and other sources of ignition. May ignite or explode on contact with combustible materials.

INCOMPATIBILITIES: amines, bases, acids, metal oxides, cyanides, combustible materials, halogens, metals, oxidizing materials, metal salts, reducing agents

HAZARDOUS DECOMPOSITION:

Decomposition products on contact with water or moisture: hydrogen fluoride

Thermal decomposition or combustion products: halogenated compounds, hydrogen

POLYMERIZATION: May polymerize.

11. TOXICOLOGICAL INFORMATION

HYDROGEN FLUORIDE:

IRRITATION DATA: 50 mg eyes-human severe; 50 percent/3 minute(s) skin-rat severe

TOXICITY DATA: 1100 mg/m³/60 minute(s) inhalation-rat LC50

LOCAL EFFECTS:

Corrosive: inhalation, skin, eye, ingestion

ACUTE TOXICITY LEVEL:

Highly Toxic: inhalation

TARGET ORGANS: central nervous system, blood, kidneys, liver, lungs, skeletal system

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: bone, joint or tooth disorders, kidney disorders, respiratory disorders

MUTAGENIC DATA: Available.

REPRODUCTIVE EFFECTS DATA: Available.

12. ECOLOGICAL INFORMATION

ECOTOXICITY DATA:

FISH TOXICITY: 51 mg/L 96 hours LC50 *Oncorhynchus mykiss*.

INVERTEBRATE TOXICITY: 97 mg/L 48 hours EC50 (hard water) *Daphnia magna*;

ALGAL TOXICITY: 43 mg/L 96 hours EC50 *Scenedesmus subspicatus*

FATE AND TRANSPORT:

HENRY'S LAW CONSTANT: 9.6

BIODEGRADATION: This material is believed to be subject to biodegradation.

ENVIRONMENTAL SUMMARY: Highly volatile from water.

13. DISPOSAL CONSIDERATIONS

Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262.
Hazardous Waste Number(s): U134.

14. TRANSPORT INFORMATION

U.S. DOT 49 CFR 172.101:
PROPER SHIPPING NAME: Hydrogen fluoride, anhydrous
ID NUMBER: UN1052
HAZARD CLASS OR DIVISION: 8
PACKING GROUP: I
LABELING REQUIREMENTS: 8; 6.1
QUANTITY LIMITATIONS:
PASSENGER AIRCRAFT OR RAILCAR: Forbidden
CARGO AIRCRAFT ONLY: Forbidden



CANADIAN TRANSPORTATION OF DANGEROUS GOODS:
SHIPPING NAME: Hydrogen fluoride, anhydrous
UN NUMBER: UN1052
CLASS: 8; 6.1
PACKING GROUP/CATEGORY: I

15. REGULATORY INFORMATION

U.S. REGULATIONS:
CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4):
HYDROGEN FLUORIDE, (as F): 100 LBS RQ

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355 Subpart B):
HYDROGEN FLUORIDE, (as F): 100 LBS TPQ

SARA TITLE III SECTION 304 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355 Subpart C):
HYDROGEN FLUORIDE, (as F): 100 LBS RQ

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

SARA TITLE III SECTION 313 (40 CFR 372.65):

HYDROGEN FLUORIDE, (as F)

**OSHA PROCESS SAFETY (29 CFR 1910.119):
HYDROGEN FLUORIDE, (as F): 1000 LBS TQ**

STATE REGULATIONS:

California Proposition 65: Not regulated.

CANADIAN REGULATIONS:

WHMIS CLASSIFICATION: A, E.

NATIONAL INVENTORY STATUS:

U.S. INVENTORY (TSCA): Listed on inventory.

TSCA 12(b) EXPORT NOTIFICATION: Not listed.

CANADA INVENTORY (DSL/NDSL): Not determined.

16. OTHER INFORMATION

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