



8210 N. Austin Avenue, Morton Grove, IL 60053-0519, U.S.A.
 847-967-6000 800-323-8144
 (Monday - Friday: 7:30 a.m. - 4:00 p.m. CST)

Emergency Contact:
 INFOTRAC 800-535-5053 [U.S.A.]

Name: *N*-Methyl-*N*-(*tert*-butyldimethylsilyl)trifluoroacetamide
 Code: 270240, 270241, 270242, 270243, 270245

..... **MATERIAL SAFETY DATA SHEET**

SECTION 1 PRODUCT IDENTIFICATION

Name: *N*-Methyl-*N*-(*tert*-butyldimethylsilyl)trifluoroacetamide
 Code: 270240, 270241, 270242, 270243, 270245

SECTION 2 COMPOSITION, INFORMATION ON INGREDIENTS

Synonyms

MtBSTFA; *N*-(*t*-butyldimethylsilyl)-*N*-methyltrifluoroacetamide

CAS #: 77377-52-7

MF: C₉H₁₈F₃NOSi

Ingredients

	<i>Concentration (%/wt)</i>	
MtBSTFA (25561-30-2).....	NLT	99.0 %
Manufacturing Impurities.....		<1.0 %

SECTION 3 HAZARDS IDENTIFICATION

Precautionary Statements

Combustible. Irritant.

See Sections 8 and 11 for further details.

..... **Emergency Overview**

NFPA Ratings (Scale 0-4); Health = 2; Fire = 2; Reactivity = 2; ~~W~~

Liquid: Clear, colorless with a strong odor

Combustible liquid and vapor. Keep away from heat and ignition sources.

Do not put water directly on the fire. Vapor or liquid readily hydrolyzes with moist air or water to produce corrosive hydrofluoric acid, which in contact with metal can produce flammable and/or explosive hydrogen gas.

Can cause severe irritation and possible burns to skin, eyes, mucous membranes, and upper respiratory system due to the formation of corrosive hydrofluoric acid when MtBSTFA reacts with the water in the skin, eyes, and mucous membranes.

The properties of this material have not been fully investigated. Use due caution in handling and use of this material.

May emit toxic fumes under fire conditions—potential chemical or thermal decomposition products: carbon oxides, silicon oxides, nitrogen oxides, hydrogen fluoride

Standard chemical handling precautions: Avoid breathing vapors or mists. Avoid contact with eyes, skin, and clothing. Wash thoroughly after handling.

Target organs: eyes, skin, mucous membranes, respiratory system.

See Sections 4, 5, 6, 8, 9, and 10.

Other Hazard Information

This compound has not fully been tested for toxicological, irritation, or similar tendencies.

Primary Route(s) of Entry: Eye or Skin contact, Inhalation

Corrosive hydrofluoric acid (strong acid) is formed when MtBSTFA reacts with the water in the skin, eyes, and mucous membranes; Hydrofluoric acid is destructive to skin, eye, and mucous membranes. Immediate flushing of exposed area with excess water may minimize potential damage.

Eye: May cause severe irritation, burns, conjunctivitis, and corneal damage. May cause severe pain, redness, swelling, and watering.

Skin: May cause severe skin irritation or burns. Harmful if absorbed through skin.

Inhalation: May cause severe irritation or burns to mucous membranes and upper respiratory tract. Harmful

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if inhaled. Severe inhalation may be fatal due to spasm, inflammation and edema of the larynx and bronchi, chemical pneumonitis and pulmonary edema. Prolonged or repeated inhalation may cause tooth decay.

Ingestion: May cause irritation or tissue destruction to the digestive system. Harmful if ingested. Aspiration of liquid while vomiting may seriously injure lungs. In sufficient quantities corrosive materials can be fatal due burns to the mouth, throat, stomach, and digestive system tissues.

Acute: See above route.

Chronic: Prolonged or repeated skin contact may cause dermatitis and respiratory irritation leading to frequent attacks of bronchial infection. See specific route above for other effects.

Symptoms: Results of overexposure may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, vomiting and/or dizziness and/or suffocation.

Pre-existing conditions that may be aggravated: respiratory conditions, skin, or eye conditions.

See Section 11 for additional toxicological data.

SECTION 4 FIRST AID MEASURES

Eye contact: Immediately flush eyes with copious amounts of water or eyewash solution for at least 15 minutes; lift eyelids occasionally. If irritation persists, consult physician.

Skin contact: Immediately remove contaminated clothing and shoes, then wash skin with soap and copious amounts of water. If irritation persists, consult physician.

Inhalation: Remove to fresh air. If not breathing, give artificial respiration and keep person warm and at rest. If breathing is difficult, give oxygen; consult physician.

Ingestion: Wash out mouth with water provided person is conscious; give large amounts of water or milk. Repeat if vomiting occurs. Ingested corrosive should be diluted approximately 100 times to render it harmless to tissues consult physician; DO NOT induce vomiting without first consulting physician. If vomiting occurs, keep head lower than hips to help prevent aspiration. Maintain airway and respiration. Treat symptomatically and supportively.

Wash contaminated clothing before reuse.

Physician note: Symptomatic and supportive care. There is no specific antidote, however can be treated same as hydrofluoric acid exposure. Treatment based on physician judgment in response to reactions of the patient.

SECTION 5 FIRE FIGHTING MEASURES

Flash Point: 124°F (51°C) Method: cc Flammable Limits: upper: NE
 lower: NE

OSHA Flammability Class: II Autoignition: NE

NFPA: See Section 3 **Hazards Identification Emergency Overview** above.

Extinguishing Media

carbon dioxide, dry chemical powder, or appropriate foam.

Special or Standard Fire Fighting Procedures

Standard precautions for fighting large fires involving chemicals: Wear self-contained breathing apparatus (SCBA) and protective clothing to prevent contact with skin and eyes.

Standard Fire and Explosion Hazards

Avoid inhalation of material or combustion by-products.

Unusual Fire and Explosion Hazards

Combustible liquid and vapor. Exposure to oxidizers could start or accelerate fire conditions.

Do not put water directly on the fire as vapor or liquid readily hydrolyzes to produce corrosive hydrofluoric acid, which in contact with metal can produce flammable and/or explosive hydrogen gas.

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Hazardous Combustion or Decomposition Products

May decompose on contact with water or moist air to produce corrosive hydrofluoric acid. May emit oxides of carbon, oxides of silicon, oxides of nitrogen, acid halides

SECTION 6 ACCIDENTAL RELEASE MEASURES

Eliminate all ignition sources/slight fire hazard in small quantities. Use spark proof tools.
 Evacuate unnecessary people from area. Isolate spilled material. Ventilate area.
 Wear protective clothing to prevent contact with skin and eyes (lab coat, gloves, safety glasses).
 Wear NIOSH/MSHA approved respirator for organic and acidic vapor to prevent inhalation irritation.
 If neat, or in solution, use chemically compatible spill pillows, or similar adsorbent material.
 Sweep up, seal in appropriate hazardous waste container, and hold for proper waste disposal.
 Avoid inhalation of vapors or contaminated dust. Wash spill site after material pickup is complete.
 Standard chemical precautions: Keep out of water supplies and sewers.

SECTION 7 HANDLING AND STORAGE

General Handling Measures

See Section 8 Below.

General Storage Measures

Store in a cool, dry place with adequate ventilation, suitable for combustibles away from ignition sources.
 Store away from oxidizing materials.

Special Storage Instructions

Store in tinted glass bottle under nitrogen.

Special Handling Instructions

Protect from moisture. Vapor or liquid readily hydrolyzes with moist air or water to produce corrosive hydrofluoric acid, which in contact with metal can produce flammable and/or explosive hydrogen gas.
 Take appropriate precautions for handling combustible liquids.
 This chemical will react with the moisture in the body to produce corrosive hydrofluoric acid.
 Avoid physical contact and do not inhale vapors.

SECTION 8 EXPOSURE CONTROLS, PERSONAL PROTECTION

Airborne Exposure Limits

		TWA		STEL		Ceiling		skin
		ppm	mg/m ³	ppm	mg/m ³	ppm	mg/m ³	
MtBSTFA 77377-52-7	OSHA - PEL	NE	NE	NE	NE	NE	NE	NE
	ACGIH - TLV	NE	NE	NE	NE	NE	NE	NE
Hydrogen Fluoride 77377-52-7	OSHA - PEL	3	2	6	5	NE	NE	NE
	ACGIH - TLV	NE	NE	3	2.6	3	2.6	NE

NE = Not established; * Hydrogen fluoride may be formed on contact with humid air or water.

Special/Other Control Measures

Odor threshold: NE

Personal Protective Equipment (PPE)

Chemical safety eyewear or goggles, and protective clothing (e.g., lab coat)
 Compatible chemical-resistant gloves: Rubber (e.g., natural rubber, neoprene, nitrile, or equivalent)
 NIOSH/MSHA approved respirator for organic/acid gas, dust, and mists.

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Other Standard Safety Equipment and Engineering Preventive Measures

Safety shower and eye wash
 Mechanical exhaust required. Hood recommended.

General Precautions and Handling Measures

Avoid ingestion, inhalation and contact with eyes, skin, and clothing.
 Avoid prolonged or repeated exposure. Wash thoroughly after handling

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Chemical Family: MtBSTFA: halogenated acetamide; silyl *Use:* Analytical Silylation Reagent for GC

Appearance, Odor, and Other Properties

clear, colorless liquid	<i>Odor:</i> Strong odor
<i>MP:</i> NE	<i>FW:</i> 241.33
<i>bp:</i> 343°F (172°C)	<i>Solubility in Water:</i> reacts: hydrolyzes/decomposes
<i>VP (mmHg):</i> NE	<i>Specific Gravity (H₂O = 1.0):</i> 1.023
<i>% Volatiles:</i> NE	<i>Vapor Density:</i> 1.121 (Air = 1.0)
<i>Evap. Rate:</i> NE	<i>Refractive Index:</i> 1.402
<i>viscosity:</i> NE	<i>pH:</i> NE
<i>Solubility in Organic Solvents:</i> NE	

SECTION 10 STABILITY AND REACTIVITY

Stability

Stable if stored under nitrogen and protected from moisture.

Incompatibilities

Strong oxidizers (Fire/Explosion Hazard)
 Metals
 Water, moisture, or humid air. Do not allow water contact. Vapor or liquid readily hydrolyzes with moist air or water to produce corrosive hydrofluoric acid, which in contact with metal can produce flammable and/or explosive hydrogen gas.

Precautions

Avoid incompatibilities.
 Protect from heat and ignition sources. Keep out of water supplies and sewers.

Hazardous Combustion or Decomposition Products

May decompose on contact with water or moist air to produce corrosive hydrofluoric acid. May emit oxides of carbon, oxides of silicon, oxides of nitrogen, acid halides

Hazardous Polymerization

None

SECTION 11 TOXICOLOGICAL INFORMATION

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

RTECS #:

CAS #:

not assigned	MtBSTFA	77377-52-7
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Only selected Registry of Toxic Effects of Chemical Substances data (RTECS) is presented here.
 See actual entry in RTECS for complete information.

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Irritation Data

	eye rbt	skn rbt
MtBSTFA	NDA	NDA

NDA = No data available

Toxicity Data

	orl	ihl	other
MtBSTFA	NDA	NDA	NDA

Carcinogenicity

	OSHA	IARC	NTP	ACGIH	NIOSH	Notes
MtBSTFA	NL	NL	NL	NL	NL	None

NL = Not Listed as a carcinogen;

Teratogenicity and Reproductive Effects

No data available.

Mutagenicity

No data available.

Miscellaneous

Corrosive hydrofluoric acid is formed when MTBSTFA reacts with the water in the skin, eyes, and mucous membranes; Hydrofluoric acid is destructive to skin, eye, and mucous membrane tissues.

Acute Effects

See specific route responses in Section 3 **Hazards Identification** above.

Chronic Effects

See Section 3 **Hazards Identification** above.

SECTION 12 **ECOLOGICAL INFORMATION**

No data available.

Standard Chemical Precautions

Keep out of water, air, and soil.

SECTION 13 **DISPOSAL CONSIDERATIONS**

That which cannot be recovered or recycled, should be disposed of in accordance with all applicable Federal, State, and local environmental regulations.

RCRA waste code(s): D001, D003

RCRA Hazard Class (40CFR 261): ignitable, reactive

SECTION 14 **TRANSPORT INFORMATION**

Ship in accordance with all applicable local, State, Federal, and International transportation regulations.

The following is a summary only. Check regulations for complete information:

U. S. Department of Transportation (49CFR171.101)

Shipping Name: Flammable liquids, n.o.s., (*N*-Methyl-*N*-(*tert*-butyldimethylsilyl)trifluoroacetamide)

ID Number: UN 1993

Hazard Class or Division: 3

Packing Group: PG III

Labels: Flammable Liquid

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SECTION 15 REGULATORY INFORMATION

Reviews, Standards, and Regulations

.....MtBSTFA
77377-52-7
 TSCA:..... NL*
 *This chemical s sold strictly for research and development use only.
 EINECS:..... NL
 Number..... NA
 CERCLA [Section 103 (40 CFR 302.4)]: NL
 RQ (lbs) NA
 RCRA Waste Code..... NA
 OSHA Process Safety [29 CFR 1910.119]: NL
 TQ (lbs)..... NA
 Clean Air Act
 [Section 112r (40 CFR 68)]:..... NL
 TQ (lbs) NA
 Contains Ozone Depleters (Class I or Class II) N
 [Section 103 (40 CFR 302.4)]:..... NL
 State Lists: NL
 States..... NL
 On CA 65 Significant Risk Level NL
 SARA Title III Notification [40 CFR 302.4]:
 Section 302/304 (EHS) Ingredient [40 CFR 355.3]..... NL
 TPQ (lbs)..... NA
 RQ (lbs) NA
 Section 313 Ingredient [40 CFR 372.65]..... NL

Hazard Classes

MtBSTFA + tBDMCS	Sara	Acute	Chronic	Fire	Pressure	Reactivity
	Title III	Y	N	Y	N	Y
		Health	Flammability	Reactivity	Special Hazards	
	NFPA	2	2	2	W	
	HMIS	U	2	2	None	

Risk Phrases:

Caution: The properties of this material have not been fully investigated.

R10.....Flammable (EU) (combustible -- USA)
 R20/21/22.....Harmful by inhalation, in contact with skin, and if swallowed.
 R36/37/38.....Irritating to eyes, skin, and respiratory system

Safety Phrases:

S6/7/8/9.....Keep under nitrogen in a dry, tightly closed container, in a well ventilated place.
 S16.....Keep away from sources of ignition--no smoking.
 S23/S24/25.....Do not breathe vapors. Avoid contact with skin and eyes.
 S26.....In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
 S36/37/39.....Wear suitable protective clothing, gloves, and eye/face protection

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SECTION 16 **OTHER INFORMATION**

Miscellaneous

The health and toxicological hazards of this compound have not been fully investigated; therefore, this substance must be handled only by, or under close supervision of those qualified in the handling and use of potentially hazardous substances.

This MSDS was revised as follows:

Updated to the current format to eliminate some unnecessary duplication of information.

<i>Section</i>	<i>Changes</i>
2	Updated ingredients section
3	Updated dated inhalation entry. Clarified and eliminated duplicate information in this section.
3, 11	Moved carcinogen information from Section 3 to 11 and eliminated duplicate information.
3, 15	Corrected NFPA from H1 to H2
6	Updated spill procedures
7	Clarified language
8	Updated exposure limits to include by-product: HF
15	Updated Risk and Safety Phrases

Disclaimer

The above information is believed to be correct, but does not purport to be all-inclusive and shall be used only as a guide. Regis Technologies, Inc., does not guarantee said information is accurate or complete, *nor shall any of this information constitute a warranty, whether expressed or implied, as to the safety of the goods, the merchantability of the goods, or the fitness of the goods for a particular purpose.* Adjustment may be required to conform to the actual conditions of usage. Regis Technologies, Inc. shall not be held liable for any damage resulting from handling or from contact with the above product, nor for the results obtained, or for incidental or consequential damage arising from the use of these data. No freedom from infringement of any patent, copyright or trademark is to be inferred.

Approved of by: MBF

This is the last page of this MSDS.

Reviewed and re-approved of with minor changes to the abbreviations in the footer and format.
 by: Jon Pilli

07/21/2008