

Regis Technologies, Inc.

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.]

MATERIAL SAFETY DATA SHEET

SECTION 1 PRODUCT IDENTIFICATION.....

Name: Boron Trifluoride in Methanol (14% w/v)
Code: 270260, 270261, 270262, 270263, 270264, 270265

SECTION 2 COMPOSITION, INFORMATION ON INGREDIENTS

Synonyms

BF₃/Methanol; Trifluoro(methanol)Boron; Boron fluoride (BF₃), compd. with methanol (1:1); Boron fluoride methanolate; Boron trifluoride compd. with methanol (1:1); Methoxytrifluoroboric acid; Trifluoro(methanol)boron

CAS #: 373-57-9

MF: BF₃.CH₃OH

Ingredients

	Concentration (%/wt)
BF ₃ [7637-07-2].....	15.04 %
Methanol [67-65-1].....	84.96 %
Manufacturing Impurities.....	NA

SECTION 3 HAZARDS IDENTIFICATION.....

Precautionary Statements

Flammable, Toxic, Corrosive Liquid

See Sections 8 and 11 for further details.

.....**Emergency Overview**.....

NFPA Ratings (Scale 0-4); Health = 3; Fire = 3; Reactivity = 2 ~~W~~;

Liquid: Clear, colorless with a strong, pungent odor

Flammable, toxic, corrosive liquid and vapor may cause flash fire. Keep away from ignition sources.

Contact with water or moisture may liberate hydrofluoric acid that in contact with metal can generate flammable/explosive hydrogen gas.

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

Poison. Corrosive—Cause burns to all body tissues. Narcotic or anesthetic effects are possible. May be fatal or cause blindness if swallowed. Harmful if inhaled or absorbed through skin. **Readily absorbed through skin.** Cannot be made nonpoisonous.

Emits toxic fumes under fire conditions—potential chemical or thermal decomposition products: carbon monoxide, carbon dioxide, hydrogen fluoride, borane, boron oxides

Standard chemical handling precautions: Avoid ingestion or breathing vapors or mists.

Avoid contact with eyes, skin, and clothing. Wash thoroughly after handling.

Target organs: central nervous system, eyes, skin, lung, liver, kidneys, heart, mucous membranes.

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: Inhalation, Ingestion, Eye, Skin— *Readily absorbed through skin.*

Corrosive hydrofluoric acid (strong acid) is formed when BF₃ reacts with the water in the skin, eyes, and mucous membranes; Hydrofluoric acid is destructive to skin, eye, and mucous membrane tissues.

BF₃/Methanol may immediately dehydrate tissues upon contact

Eye: Can cause burns and blindness. May cause: pain, severe irritation, dryness, corneal damage.

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- Skin:** Can cause burns. Toxic—may be fatal by skin absorption—. **Readily absorbed through skin—** with effects similar to that of inhalation and ingestion. May cause pain, severe irritation, redness and dryness. Prolonged or repeated contact may cause defatting of skin.
- Inhalation:** Can cause burns. May cause severe irritation to mucous membranes and upper respiratory system. May be harmful or fatal if inhaled due to spasm, inflammation and edema of the larynx and bronchi, chemical pneumonitis and pulmonary edema. Prolonged or repeated inhalation may cause tooth decay. Methanol may cause optical nerve and central nervous system effects with headache, drowsiness, nausea, vomiting, blurred vision, blindness, coma, and death. Delayed symptoms possible—A person may get better, then worse again up to 30 hours later.
- Ingestion:** Can cause burns or GI disturbances. May be harmful or fatal if ingested due to mucous membrane corrosion and other tissue in the esophagus and GI tract. Methanol poisoning can occur with symptoms noted in inhalation above. Usual fatal dose is 100-125 mL of methanol.
- Acute:** See above route.
- Chronic:** See above route.
- Symptoms:** Results of overexposure may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, vomiting and/or dizziness and/or vision difficulties, *Pre-existing conditions that may be aggravated:* respiratory, eye, skin, liver, kidney

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 (Dreisbach & Robertson; Handbook of Poisoning; 12th Ed.); 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. No specific antidote, however can be treated same as hydrofluoric acid exposure and methanol toxicity. Treatment based on physician judgement in response to reactions of the patient.

SECTION 5 FIRE FIGHTING MEASURES.....

Flash Point: 11°F (52°C) *Method:* cc *Flammable Limits:* upper: 6.7
(Based on Methanol) lower: 36.5

OSHA Flammability Class: IB *Autoignition:* NE

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

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Extinguishing Media

Carbon dioxide, dry chemical powder, sand, fog, 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.

Do not allow extinguishing media to enter container.

Unusual Fire and Explosion Hazards

Highly flammable, toxic and corrosive liquid and vapor hydrolyzes with moisture to produce corrosive hydrogen fluoride gas, that in contact with metal can produce flammable and/or explosive hydrogen gas.

Vapors are heavier than air, may travel long distances along the ground to ignition sources and flash back.

Vapor-air mixtures are explosive above flash point, within above stated limits.

Containers may build pressure or rupture when heated.

Container explosion may occur under fire conditions.

Water spray may be used to cool fire-exposed containers.

Fire may release irritating, and corrosive hydrogen fluoride fumes.

Hazardous Combustion or Decomposition Products

May emit carbon monoxide, carbon dioxide, hydrogen fluoride, boron oxides, borane; *May decompose on contact with water.*

SECTION 6 ACCIDENTAL RELEASE MEASURES

Eliminate all ignition sources. 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/acid gas, dust, and mists to prevent inhalation.

Contain and recover material when possible.

Use chemically compatible spill pillows, or similar adsorbent material. This will help blanket corrosive, flammable vapors.

Sweep up, seal in appropriate hazardous waste container, and hold for proper waste disposal.

Wash spill site after material pickup is complete.

Do not allow material to enter drains or watercourses.

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 corrosive flammables away from ignition sources.

See Section 8 Below.

Special Storage Instructions

None.

Special Handling Instructions

Take appropriate precautions for handling flammable and corrosive liquids.

Empty containers retain product residue, (liquid/vapor), and can be dangerous.

This chemical will react with the moisture in the body to produce corrosive hydrofluoric acid.

Readily adsorbed through skin—immediately remove contaminated clothing. Wash thoroughly after handling.

Avoid physical contact and do not inhale vapors.

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SECTION 8 EXPOSURE CONTROLS, PERSONAL PROTECTION

Airborne Exposure Limits

		TWA (8H)		STEL		Ceiling Limit		Ceiling (skin)	
		ppm	mg/m ³	ppm	mg/m ³	ppm	mg/m ³	ppm	ppm
BF ₃ /Methanol	OSHA - PEL	NE	NE	NE	NE	NE	NE	NE	NE
373-57-9	ACGIH - TLV	NE	NE	NE	NE	NE	NE	NE	NE
Boron Trifluoride	OSHA - PEL	NE	NE	NE	NE	1	3	NE	NE
7637-07-2*	ACGIH - TLV	3	2	6	NE	1	NE	NE	NE
Methanol	OSHA - PEL	200	260	NE	NE	NE	NE	NE	NE
67-65-1	ACGIH - TLV/STEL	NE	NE	NE	NE	NE	NE	200	250
Hydrogen	OSHA - PEL	NE	NE	NE	NE	NE	NE	NE	NE
Fluoride *	ACGIH - TLV	3	2	6	NE	3	2.3	NE	NE

* Hydrogen fluoride may be formed on contact with humid air or water.

NE = Not established

Special/Other Control Measures

Odor threshold: NE

Personal Protective Equipment (PPE)

Chemical safety eyewear or goggles

Compatible chemical-resistant gloves: Rubber (e.g., natural rubber, neoprene, nitrile, or equivalent), Silver Shield®, Viton®, or 4H®

NIOSH/MSHA approved respirator for organic/ acid gas, dust, and mists.

Protective Clothing (e.g., lab coat)

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

Avoid inhalation

Avoid contact with eyes, skin, and clothing

Avoid prolonged or repeated exposure

Wash thoroughly after handling. Dispose of contaminated footwear.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES.....

Chemical Family: halogenated boron in organic solvent

Use: Analytical Derivatization Acylation Reagent for GC

Appearance, Odor, and Other Properties

Appearance: clear, colorless liquid

Odor: pungent odor

MP/Freeze Point: -97.8°C [-144°F] (methanol)

bp: 65°C [149°F]

Water Reactive: yes-hydrolyzes

Solubility in Water: decomposes

FW: 67.81 (BF₃); 32.04 (MeOH)

Specific Gravity (H₂O = 1.0): 0.930

VP (mmHg): 96mm @ 20C

Vapor Density (air=1): 1.11

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% Volatiles: 85 *Evap. Rate (BuAc = 1.0):* 36
pH: NE *Refractive Index (n_D^{20}):* 1.3208
Solubility in Organic Solvents: ether

SECTION 10 STABILITY AND REACTIVITY

Stability

Stable if stored under nitrogen and protected from moisture.

Incompatibilities

Strong Acids, acid chlorides, acid anhydrides
Strong Oxidizers
Strong Reducing Agents
Alkali metals
Water, moisture, or humid air-Vapor or liquid hydrolyzes with moisture to produce corrosive hydrofluoric acid, which in contact with metal can produce flammable and/or explosive hydrogen gas.
Metals (aluminium)
Will attack some types of plastics, rubber, and coatings.

Precautions

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

Hazardous Combustion or Decomposition Products

May emit carbon monoxide, carbon dioxide, hydrogen fluoride, borane, boron oxides

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	BF ₃ /Methanol	373-57-9
ED2275000	Boron Trifluoride	7637-07-2
PC1400000	Methanol	67-56-1

Only selected Registry of Toxic Effects of Chemical Substances data (RTECS) is presented here.
See actual entry in RTECS for complete information.

Irritation Data

	eye	skin
BF ₃ /Methanol	NDA	NDA
Boron Trifluoride	NDA	NDA
Methanol	eye rbt 40 mg mod eye rbt 100 mg/24H mod	skn rbt 20 mg/24H mod

NDA = No data available

Corrosive hydrofluoric acid is formed when BF₃ reacts with the water in the skin, eyes, and mucous membranes; Hydrofluoric acid is extremely destructive to skin, eye, and mucous membrane tissues.

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Toxicity Data

	oral	inhalation	dermal
BF ₃ /Methanol	NDA	NDA	NDA
Boron Trifluoride	NDA	ihl rat LC50 1180mg/m ³ /4H	NDA
Methanol	orl man LD50 6422mg/kg; orl rat LD50 5629mg/kg	ihl rat LC50 64000ppm/4H;	skn rbt LD50 15800mg/kg

Carcinogenicity

	OSHA	IARC	NTP	ACGIH	NIOSH	Notes
BF ₃ /Methanol	NL	NL	NL	NL	NL	None
Boron Trifluoride	NL	NL	NL	NL	NL	None
Methanol	NL	NL	NL	NL	NL	None

NL = Not Listed as a carcinogen;

Teratogenicity and Reproductive Effects

Methanol may be hazardous to the male or female reproductive system. It passes through the placental barrier and can cause birth defects.

Mutagenicity

No data available.

Miscellaneous

No data available.

Acute and Chronic Effects

Section 3 **Hazards Identification** above.

SECTION 12 ECOLOGICAL INFORMATION

Environmental Fate

Methanol: When released to soil, methanol is expected to quickly evaporate, readily biodegrade, and leach into groundwater. In water, methanol should readily biodegrade and have a half-life of more than 30 days. This material is not expected to significantly bioaccumulate. In air, it may be moderately degraded by reaction with photochemically produced hydroxy radicals and be removed from the atmosphere to a moderate extent by wet decomposition. In air, it is expected to have a half-life of 10 -30 days.

Boron Trifluoride: No data available.

Ecotoxicity Data

Methanol: It is not expected to be toxic to terrestrial life. It is expected to be toxic to aquatic life. The fish LC/96-hour values are over 100 mg/L

Boron Trifluoride: No data available.

Standard Chemical Precautions

Keep out of air, water, 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, D002, F003 RCRA Hazard Class (40CFR 261): ignitable, corrosive

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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 liquid, corrosive, n.o.s. (methanol, boron trifluoride)
 ID Number: UN2924
 Hazard Class or Division: 3, Subsidiary Risks: 6.1, 8
 Packing Group: PG II
 Labeling: Flammable Liquid, Corrosive

SECTION 15 REGULATORY INFORMATION

Reviews, Standards, and Regulations

	BF ₃ /Methanol	BF ₃	Methanol
CAS Number	373-57-9	7637-07-2	67-65-1
TSCA	Y	Y	Y
This compound is sold strictly for research and development use.			
EINECS	Y	Y	Y
Number	211-680-5	231-569-5	200-659-6
CERCLA [Section 103 (40 CFR 302.4)]	NL	NL	Y
RQ (lbs)	NA	NA	5,000
RCRA Waste Code	NL	NL	U154 (pure only)
OSHA Process Safety [29 CFR 1910.119]	NL	Y	NL
TQ (lbs)	NA	250	NA
Clean Air Act			
[Section 112r (40 CFR 68)]	NL	Y	NL
TQ (lbs)	NA	5,000	NA
Contains Ozone Depleters (Class I or Class II)	N	N	N
State Lists	NL	Y	Y
States	NL on CA, FL	on CA, FL, MA	on CA, FL, MA
	MA, MN, NJ, PA	MN, NJ, PA	MN, NJ, PA
On CA 65 Significant Risk Level	NL	NL	NL
SARA Title III Notification [40 CFR 302.4]:			
Section 302/304 (EHS) Ingredient [40 CFR 355.3]	NL	Y	NL
TPQ (lbs)	NA	500	NA
RQ (lbs)	NA	500	NA
Section 313 Ingredient [40 CFR 372.65]	NL	Y	Y

Hazard Classes

Sara	Acute	Chronic	Fire	Pressure	Reactivity
Title III	Y	Y	Y	N	Y
	Health	Flammability	Reactivity	Special Hazards	
NFPA	3	3	2	W	
HMIS	3	3	2	None	

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Risk Phrases:

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

Corrosive.

R1Toxic

R11Highly Flammable

R34.....Causes burns

R39/23/24/25Toxic: danger of very serious irreversible effects through inhalation, in contact with skin, and if swallowed.

R36/37/38.....Irritating to eyes, skin, and respiratory system

R40.....Possible risk of irreversible effects

R67Vapors may cause drowsiness and dizziness

Safety Phrases:

S6/7/8/9Keep under nitrogen in a dry, tightly closed container, in a well ventilated place.

S16Keep away from sources of ignition-no smoking.

S23/24/25Do not breathe vapors. Avoid contact with skin and eyes.

S26In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S33.....Take precautionary measures against static discharges.

S36/37/39Wear suitable protective clothing, gloves, and eye/face protection

S44If you feel unwell, seek medical advice immediately (show the label where possible.)

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:

This MSDS was updated from a 10-section format to a 16-section format. Consider all sections to contain new information.

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

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