

Boron Trifluoride Ether Complex**000000011324**

Version 1.6

Revision Date 08/31/2020

Print Date 11/01/2023

SECTION 1. IDENTIFICATION

Product name : Boron Trifluoride Ether Complex

Number : 000000011324

Product Use Description : Catalyst, Chemical derivatives

Manufacturer or supplier's details : Honeywell International Inc.
115 Tabor Road
Morris Plains, NJ 07950-2546

For more information call : 800-522-8001
+1-973-455-6300(Monday-Friday, 9:00am-5:00pm)

In case of emergency call : Medical: 1-800-498-5701 or +1-303-389-1414
: Transportation (CHEMTREC): 1-800-424-9300 or +1-703-527-3887
:
: (24 hours/day, 7 days/week)

SECTION 2. HAZARDS IDENTIFICATION**Emergency Overview**

Form : liquid

Color : colourless to pale yellow

Odor : strong pungent

Classification of the substance or mixture

Classification of the substance or mixture : Flammable liquids, Category 2
Acute toxicity, Category 4, Oral
Acute toxicity, Category 4, Inhalation
Skin corrosion, Category 1B
Serious eye damage, Category 1
Specific target organ toxicity - repeated exposure, Category 1, Kidney

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GHS Label elements, including precautionary statements

Symbol(s)

:



Signal word

: Danger

Hazard statements

: Highly flammable liquid and vapour.
Harmful if swallowed or if inhaled.
Causes severe skin burns and eye damage.
Causes damage to organs through prolonged or repeated exposure.

Precautionary statements

: **Prevention:**
Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking.
Keep container tightly closed.
Ground/bond container and receiving equipment.
Use explosion-proof electrical/ ventilating/ lighting equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
Wash skin thoroughly after handling.
Do not eat, drink or smoke when using this product.
Use only outdoors or in a well-ventilated area.
Wear protective gloves/ protective clothing.
Wear eye protection/ face protection.
Wear respiratory protection.**Response:**

IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell.

IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.

IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Immediately call a POISON CENTER/ doctor.

Wash contaminated clothing before reuse.

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In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.

Storage:

Store in a well-ventilated place. Keep cool.
Store locked up.

Disposal:

Dispose of contents/ container to an approved waste disposal plant.

Carcinogenicity

No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP, IARC, or OSHA.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Formula : C₄H₁₀BF₃O

Chemical nature : Substance

Chemical name	CAS-No.	Concentration
Boron Trifluoride Ether Complex	109-63-7	>95.00 %
Diethyl ether	60-29-7	<5.00 %

SECTION 4. FIRST AID MEASURES

Inhalation : Move to fresh air. If breathing is irregular or stopped, administer artificial respiration. If breathing is difficult, give oxygen. Use oxygen as required, provided a qualified operator is present. Call a physician immediately.

Skin contact : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash contaminated clothing before re-use. Discard

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contaminated shoes. Call a physician immediately.

Eye contact : Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Keep eye wide open while rinsing. Call a physician immediately.

Ingestion : Unlikely route of exposure. If ingested, give water to dilute stomach contents. Never give anything by mouth to an unconscious person. Call a physician immediately.

Notes to physician

Indication of immediate medical attention and special treatment needed, if necessary : Treat as a corrosive acid. Boron Trifluoride breaks down into Boric and Fluoroboric acid (strong corrosive acids). May form fluoride ions under extreme conditions. Consider treatment for fluoride toxicity, hypocalcemia, and hypomagnesemia if exposure is severe.

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media : Carbon dioxide (CO₂)
Dry chemical
Cool closed containers exposed to fire with water spray.

Unsuitable extinguishing media : Avoid direct water stream and foams containing water.

Specific hazards during firefighting : Reaction with limited water forms BF₃ hydrates, liberating free ether that is extremely flammable and has hazardous storage properties. Excess water forms fluoroboric, boric and hydroxyfluoroboric acids.

Special protective equipment for firefighters : Wear self-contained breathing apparatus and protective suit.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and : Wear personal protective equipment.
Immediately evacuate personnel to safe areas.

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emergency procedures	Keep people away from and upwind of spill/leak. Ensure adequate ventilation. Remove all sources of ignition. Do not swallow. Do not breathe vapours or spray mist. Do not get in eyes, on skin, or on clothing.
Environmental precautions	: Prevent further leakage or spillage if safe to do so. Discharge into the environment must be avoided. Do not flush into surface water or sanitary sewer system. Prevent product from entering drains. Do not allow run-off from fire fighting to enter drains or water courses.
Methods and materials for containment and cleaning up	: Ventilate the area. No sparking tools should be used. Use explosion-proof equipment. For small spills, absorb on dry neutral or alkaline carrier (e.g. sand, soda ash). Collect and place in an approved chemical waste container. Close container and label Corrosive, Toxic. Dispose of container in accordance with local regulations.

SECTION 7. HANDLING AND STORAGE**Handling**

Precautions for safe handling	: Wear personal protective equipment. Use only in well-ventilated areas. Keep container tightly closed. Open containers carefully to release possible internal pressure before completely removing closure. Do not smoke. Do not swallow. Do not breathe vapours or spray mist. Do not get in eyes, on skin, or on clothing.
Advice on protection against fire and explosion	: Keep away from fire, sparks and heated surfaces. Take precautionary measures against static discharges. Ensure all equipment is electrically grounded before beginning transfer operations. Use explosion-proof equipment. Keep product and empty container away from heat and sources of ignition. No sparking tools should be used.

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No smoking.

Storage

Conditions for safe storage, including any incompatibilities : Store in area designed for storage of flammable liquids. Protect from physical damage. Keep containers tightly closed in a dry, cool and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Keep away from heat and sources of ignition. Keep away from direct sunlight. Store away from incompatible substances. Container hazardous when empty. Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective measures : Ensure that eyewash stations and safety showers are close to the workstation location.

Engineering measures : Use with local exhaust ventilation. Prevent vapour buildup by providing adequate ventilation during and after use.

Eye protection : Do not wear contact lenses. Wear as appropriate:
Safety glasses with side-shields
Goggles or face shield, giving complete protection to eyes

Hand protection : Solvent-resistant gloves
Gloves must be inspected prior to use.
Replace when worn.

Skin and body protection : Wear as appropriate:
Solvent-resistant apron
Flame retardant antistatic protective clothing.
If splashes are likely to occur, wear:
Protective suit

Respiratory protection : In case of insufficient ventilation, wear suitable respiratory

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equipment.

Use NIOSH approved respiratory protection.

For visible releases of BF₃, wear a NIOSH approved full-face supplied air or self-contained breathing apparatus (SCBA).

Hygiene measures : When using, do not eat, drink or smoke.
 Wash hands before breaks and immediately after handling the product.
 Keep working clothes separately.
 Remove and wash contaminated clothing before re-use.
 Do not swallow.
 Do not breathe vapours or spray mist.
 Do not get in eyes, on skin, or on clothing.

Exposure Guidelines

Components	CAS-No.	Value	Control parameters	Update	Basis
Boron trifluoride	7637-07-2	TWA : Time weighted average	(0.1 ppm)	03 2016	ACGIH:US. ACGIH Threshold Limit Values, as amended
Boron trifluoride	7637-07-2	Ceiling : Ceiling Limit Value:	(0.7 ppm)	03 2016	ACGIH:US. ACGIH Threshold Limit Values, as amended
Boron trifluoride	7637-07-2	Ceil_Tim e : Ceiling Limit Value and Time Period (if specified) :	3 mg/m ³ (1 ppm)	2005	NIOSH/GUIDE:US. NIOSH: Pocket Guide to Chemical Hazards, as amended

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Boron trifluoride	7637-07-2	Ceiling : Ceiling Limit Value:	3 mg/m3 (1 ppm)	02 2006	OSHA_TRANS:US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000), as amended
Boron trifluoride	7637-07-2	Ceiling : Ceiling Limit Value:	3 mg/m3 (1 ppm)	1989	Z1A:US. OSHA Table Z-1-A (29 CFR 1910.1000), as amended
Boron trifluoride	7637-07-2	TWA : Time weighted average	2.5 mg/m3	02 2006	OSHA/Z2:US. OSHA Table Z-2 (29 CFR 1910.1000), as amended
Further information	:	Form of exposure : Dust.			
Diethyl ether	60-29-7	TWA : Time weighted average	(400 ppm)	2008	ACGIH:US. ACGIH Threshold Limit Values, as amended
Diethyl ether	60-29-7	STEL : Short term exposure limit	(500 ppm)	2008	ACGIH:US. ACGIH Threshold Limit Values, as amended
Diethyl ether	60-29-7	PEL : Permissi ble exposure limit	1,200 mg/m3 (400 ppm)	02 2006	OSHA_TRANS:US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000), as amended

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Diethyl ether	60-29-7	STEL : Short term exposure limit	1,500 mg/m ³ (500 ppm)	1989	Z1A:US. OSHA Table Z-1-A (29 CFR 1910.1000), as amended
Diethyl ether	60-29-7	TWA : Time weighted average	1,200 mg/m ³ (400 ppm)	1989	Z1A:US. OSHA Table Z-1-A (29 CFR 1910.1000), as amended

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state	: liquid
Color	: colourless to pale yellow
Odor	: strong pungent
pH	: Note: Not applicable
Melting point/range	: -60.4 °C
Boiling point/boiling range	: 125.7 °C
Flash point	: < 50 °F (10 °C) Method: closed cup
Lower explosion limit	: 1.9 %(V) Note: Based on ether component.
Upper explosion limit	: 36 %(V) Note: Based on ether component.
Vapor pressure	: 5.6 hPa

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Vapor density	:	4.9 Note: (Air = 1.0)
Density	:	1.139 g/cm ³
Water solubility	:	Note: Decomposes in contact with water.
Ignition temperature	:	160 °C Note: Based on ether component.
Molecular weight	:	141.94 g/mol

SECTION 10. STABILITY AND REACTIVITY

Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	Hazardous polymerisation does not occur.
Conditions to avoid	:	Heat, flames and sparks. Keep away from direct sunlight. Protect against water. Protect from exposure to air/oxygen.
Incompatible materials	:	Polymerizable materials Water Alkali metals Alkaline earth metals Alkyl nitrates Air Oxidizing agents
Hazardous decomposition products	:	Reaction with water yields BF ₃ and ethyl ether. Reaction of BF ₃ with water yields fluoboric acid and boric acid, the former being a strong acid.

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SECTION 11. TOXICOLOGICAL INFORMATION

- Acute oral toxicity : Acute toxicity estimate: 352.8 mg/kg
Method: Calculation method
- Acute inhalation toxicity : Acute toxicity estimate: 11 mg/l , vapour
Exposure time: 4 h
Method: Calculation method
- Acute dermal toxicity
Diethyl ether : LD50: > 20,000 mg/kg
Species: Rabbit
Method: OECD Test Guideline 402
- Skin irritation
Boron Trifluoride Ether
Complex : Species: Rabbit
Result: Corrosive
Exposure time: 1 h
- Diethyl ether : Species: Rabbit
Result: No skin irritation
Method: OECD Test Guideline 404
- Eye irritation
Diethyl ether : Species: Rabbit
Result: slight irritation
Method: OECD Test Guideline 405
- Diethyl ether : Test Method: Ames test
Metabolic activation: with and without metabolic activation
Result: negative

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Further information

Boron Trifluoride Ether Complex : Note:
May cause dental fluorosis (mottling of teeth) and hypocalcemia (low levels of calcium in blood) if permissible concentration for BF₃ is exceeded for significant periods.

Diethyl ether : Note:
Solvent vapours have a narcotic effect if inhaled in high concentrations.

SECTION 12. ECOLOGICAL INFORMATION

Toxicity to fish
Boron Trifluoride Ether Complex : LC50: 102 microliters/liter
Exposure time: 96 h
Species: *Oncorhynchus mykiss* (rainbow trout)
Test substance: Boron trifluoride

Diethyl ether : LC50: 2,560 mg/l
Exposure time: 96 h
Species: *Pimephales promelas* (fathead minnow)

Toxicity to daphnia and other aquatic invertebrates
Boron Trifluoride Ether Complex : EC50: 46 microliters/liter
Exposure time: 48 h
Species: *Daphnia magna* (Water flea)
Test substance: Boron trifluoride

Further information on ecology**SECTION 13. DISPOSAL CONSIDERATIONS**

Disposal methods : Observe all Federal, State, and Local Environmental regulations.

SECTION 14. TRANSPORT INFORMATION

DOT UN/ID No. : UN 3286

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Proper shipping name : FLAMMABLE LIQUID, TOXIC, CORROSIVE,
N.O.S.
(Boron trifluoride diethyl etherate)

Class : 3

Packing group : II

Hazard Labels : 3 (6.1, 8)

IATA

UN/ID No. : UN 3286

Description of the goods : FLAMMABLE LIQUID, TOXIC, CORROSIVE,
N.O.S.
(Boron trifluoride diethyl etherate)

Class : 3

Packaging group : II

Hazard Labels : 3 (6.1, 8)

Packing instruction (cargo aircraft) : 363

Packing instruction (passenger aircraft) : 352

Packing instruction (passenger aircraft) : Y340

IMDG

UN/ID No. : UN 3286

Description of the goods : FLAMMABLE LIQUID, TOXIC, CORROSIVE,
N.O.S.
(BORON TRIFLUORIDE DIETHYL ETHERATE)

Class : 3

Packaging group : II

Hazard Labels : 3 (6.1, 8)

EmS Number : F-E, S-C

Marine pollutant : no

SECTION 15. REGULATORY INFORMATION**Inventories**

US. Toxic Substances Control Act : On TSCA Inventory

Australia. Industrial Chemical (Notification and Assessment) Act : On the inventory, or in compliance with the inventory

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Canada. Canadian Environmental Protection Act (CEPA). Domestic Substances List (DSL) : All components of this product are on the Canadian DSL

Japan. Kashin-Hou Law List : On the inventory, or in compliance with the inventory

Korea. Existing Chemicals Inventory (KECI) : On the inventory, or in compliance with the inventory

Philippines. The Toxic Substances and Hazardous and Nuclear Waste Control Act : On the inventory, or in compliance with the inventory

China. Inventory of Existing Chemical Substances (IECSC) : On the inventory, or in compliance with the inventory

New Zealand. Inventory of Chemicals (NZIoC), as published by ERMA New Zealand : On the inventory, or in compliance with the inventory

National regulatory information

US. Drug Enforcement Administration (DEA) Listed Precursor and Essential Chemicals (21 CFR 1310) : On the United States Drug Enforcement Authority (DEA) List of Precursors and Essential Chemicals

US. EPA CERCLA Hazardous Substances (40 CFR 302) : Diethyl ether 60-29-7
: The following component(s) of this product is/are subject to release reporting under 40 CFR 302 when release exceeds the Reportable Quantity (RQ):

Reportable quantity: 500 lbs
: Boron trifluoride 7637-07-2
:

US. EPA Emergency Planning and Community Right-To-Know Act : Reportable quantity: 100 lbs
: Diethyl ether 60-29-7
: The following component(s) of this product is/are subject to the emergency planning provisions of 40 CFR 355 when there are amounts equal to or greater than the Threshold Planning

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(EPCRA) SARA Title III
Section 302 Extremely
Hazardous Substance (40
CFR 355, Appendix A)

Quantity (TPQ):

Threshold Planning Quantity:: 500 lbs

: Boron trifluoride 7637-07-2

:

Threshold Planning Quantity:: 100 lbs

SARA 302 Components

: The following components are subject to reporting levels established by SARA Title III, Section 302:

: Boron Trifluoride Ether Complex 109-63-7

SARA 313 Components

: The following components are subject to reporting levels established by SARA Title III, Section 313:

: Boron Trifluoride Ether Complex 109-63-7

SARA 311/312 Hazards: Fire Hazard
Reactivity Hazard
Acute Health Hazard
Chronic Health Hazard**CERCLA Reportable
Quantity**

: 100 lbs

California Prop. 65

: This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

Massachusetts RTK

: Boron Trifluoride Ether Complex 109-63-7

: Diethyl ether 60-29-7

New Jersey RTK

: Boron Trifluoride Ether Complex 109-63-7

: Diethyl ether 60-29-7

Pennsylvania RTK

: Boron Trifluoride Ether Complex 109-63-7

: Diethyl ether 60-29-7

WHMIS Classification: B2: Flammable liquid
E: Corrosive Material

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D1B: Toxic Material Causing Immediate and Serious Toxic Effects

This product has been classified according to the hazard criteria of the CPR and the MSDS contains all of the information required by the CPR.

SECTION 16. OTHER INFORMATION

	HMIS III	NFPA
Health hazard	: 2*	3
Flammability	: 4	2
Physical Hazard	: 2	
Instability	:	2
Special hazard	:	W

* - Chronic health hazard

Hazard rating and rating systems (e.g. HMIS® III, NFPA): This information is intended solely for the use of individuals trained in the particular system.

Further information

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text. Final determination of suitability of any material is the sole responsibility of the user. This information should not constitute a guarantee for any specific product properties.

Changes since the last version are highlighted in the margin. This version replaces all previous versions.

Previous Issue Date: 05/04/2016

Prepared by Honeywell Performance Materials and Technologies Product Stewardship Group