

JSC AVIABOR

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MATERIAL SAFETY DATA SHEET (MSDS)

according to Regulation (EC) No. 1907/2006


Version 1.0 Revision Date 21.05.2018

1.0 Identification of the substance/preparation and of the company/enterprise

- 1.1 Product identifiers** : Triethylborane (TEB), 100%
EINECS : 202-620-9
CAS : 97-94-9
RTECS : none
- 1.2 Relevant identified uses of the substance or mixture and uses advised against**
 Reacts with metal enolates to give the enoxytriethylborates, useful in selective alkylation and aldol reactions.
- 1.3 Details of the supplier of the safety data sheet**
 JSC AVIABOR, Nizhny Novgorod Region
 606000 Dzerzhinsk, Russia
 Tel: (+7)-8313-249 727, Fax:(+7)-8313-249 626
- 1.4 Emergency telephone number**
 (+7)-8313-249 750 / 630

2.0 Hazards Identification

- 2.1 Classification of the substance or mixture**
Regulation (EC) No 1272/2008 Annex VI Table

Classification		Labelling		
Hazard Class and Category Code(s)	Hazard Statement Code(s)	Pictogram Signal Word Code(s)	Hazard Statement Code(s)	Suppl. Hazard statement code(s)
Pyr.Liq. 1 Acute Tox.Oral. 3 Acute Tox. Inh.2 Skin Corr. 1B	H250 H301 H330 H314	 Danger	H250 H301 H330 H314	-

- 2.2 Label elements**
- Hazard statement(s):**
 H250 Catches fire spontaneously if exposed to air
 H301 Toxic if swallowed
 H330 Fatal if inhaled
 H314 Causes severe skin burns and eye damage
- Precautionary statement(s):**
 P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
 P222 Do not allow contact with air.
 P231+P232 Handle under inert gas. Protect from moisture.
 P260 Do not breathe dust/fume/gas/mist/vapours/spray.
 P301+P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
 P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

- P280 Wear protective gloves/protective clothing/eye protection/face protection
 P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction
 P303+P361+P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
 P310 Immediately call a POISON CENTER or doctor/physician.
 P422 Store contents under inert gas

2.3 Other hazards – none

3.0 Hazards

Triethylborane	100 wt%
Trade names/Synonyms	Triethylboron, Triethylborine, TEB
CAS-Nr.	97-94-9
EINECS	202-620-9
Chemical formula	(C ₂ H ₅) ₃ B
Molar mass	97.99
RTECS	none

4.0 First Aid Measures

4.1 Description of first aid measures

After skin contact

Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Discard contaminated clothing and shoes.

After eyes contact

Immediately flush eyes with plenty of water for at least 15 minutes, holding eyes open.

After ingestion

Give two glasses of water and permit vomiting if nauseated. Never give anything by mouth to an unconscious person.

After inhalation

Remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen.

4.2 Most important symptoms and effects, both acute and delayed

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

4.3 Indication of immediate medical attention and special treatment needed

no data available

5.0 Fire Fighting Measures

5.1 Extinguishing media

Suitable extinguishing media

Shut off source as soon as possible without risk. Control and confine fire Use water spray to control heat and protect equipment. If practical, allow fire to burn itself out. Temporary control may be obtained with foam, water spray, dry chemical, or carbon dioxide; but TEB may reignite when extinguisher is discontinued. DO NOT use halogenated fire extinguishing agents. TEB floats on water and use of water as an extinguishing agent may spread the fire. TEB burns with a green and yellow flame and produces a dense black smoke.

Unsuitable extinguishing media

DO NOT use halogenated hydrocarbon fire extinguishers.

5.2 Special hazards arising from the substance or mixture

TEB can react violently or detonate when mixed with strong oxidizing agents or halogenated hydrocarbons. TEB solution burns with green and yellow flame and produces a dense black smoke. Work upwind if possible.

5.3 Precautions for fire-fighters

Wear full protective clothing, including protective gloves and boots. For respiratory protection, wear a NIOSH/MSHA approved self-contained breathing apparatus with full facepiece operated in

a positive-pressure mode.

5.4 Further information - no data available

6.0 Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

See Section 5. FIRE FIGHTING MEASURES. Properly dispose of all residues immediately. Handle in compliance with all local, state and federal laws and regulations.

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up

Cover with dry-lime, sand, or soda ash. Place in covered containers using non-sparking tools and transport outdoors. Ventilate area and wash spill site after material pickup is complete.

6.4 Reference to other sections

For disposal see section 13.

7.0 Handling and Storage

7.1 Precautions for safe handling

Use only with clean, completely enclosed systems that have been thoroughly purged with nitrogen or argon. Keep away from heat, sparks, and flame.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed and away from oxidizing agents, organic peroxides, and halogenated Hydrocarbons, combustible materials, and temperatures above 200 0F (94 0C). Use only with adequate ventilation. Do not get in eyes or on skin. Wash thoroughly after handling. Do not breathe vapour. Do not expose to air. Handle and store in a closed system under dry nitrogen or dry argon gas. Do not store residues. Properly dispose of all residues immediately.

7.3 Specific end uses - no data available

8.0 Exposure Control and Personal Protection

8.1 Control parameters

Components with workplace control parameters

8.2 Exposure controls

Normal use & handling

When exposure to eyes or skin is possible, wear chemical protective goggles with faceshield, fire retardant protective clothing, and leather gloves. When inhalation of vapour is possible, wear a NIOSH/MSHA approved self-contained breathing apparatus with full-facepiece operated in a positive-pressure mode.

High volume safety showers and eye wash facility should be convenient to operating personnel.

Emergency handling

Wear full protective clothing, including protective gloves and boots. For respiratory protection, wear a NIOSH/MSHA approved self-contained breathing apparatus with full facepiece operated in a positive-pressure mode.

Exposure guidelines

None established for the triethylborane.

Engineering controls

Maintain a leakproof system. Use packless valves, welded piping, and other leakproof construction. Provide adequate local exhaust ventilation to minimize worker exposure. Maintain a nitrogen blanket on vessels containing TEB.

9.0 Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

Form/ Colour : Clear colourless liquid

Odour : Pungent odour

pH	: N/A
BP/BP Range	: 95 °C
MP/MP Range	: - 93 °C
Flash Point	: - 78 °C
Flammability	: N/A
Autoignition Temp.	: N/A
Oxidizing Properties	: N/A
Explosive Properties	: N/A
Explosion Limits Lower	: N/A
Vapour Pressure	: 42.6 mm Hg at 20 °C
Density	: 0.68 gm/cm ³ at 25 °C
Partition Coefficient	: N/A
Viscosity	: 0.30 centipoise at 25 °C
Vapour Density	: N/A
Saturated Vapour Conc.	: N/A
Evaporation Rate	: N/A
Decomposition Temp.	: N/A
Solvent Content	: N/A
Water Content	: reacts very slowly
Air reactivity	: oxidizes if exposed to air
Surface Tension	: N/A
Conductivity	: N/A
Miscellaneous Data	: N/A
Solubility	: N/A
9.2 Other safety information	
Bulk Density	: N/A

10.0 Stability and Reactivity

10.1 Reactivity	no data available
10.2 Chemical stability	Stable if stored and handled as recommended. Keep away from heat, sparks, and flame.
10.3 Possibility of hazardous reactions	no data available
10.4 Conditions to avoid	Exposure to moisture.
10.5 Incompatible materials	Air, oxidizers, halogenated hydrocarbons, temperatures above 94 °C (slow decomposition above this temperature; rate reported to be 4% in 60 hours at 100°C).
10.6 Hazardous decomposition products	Carbon monoxide, carbon dioxide, boron oxides

11.0 Toxicological Information

11.1 Information on toxicological effects

Because TEB is pyrophoric, exposure can cause eye, skin, and mucous membrane burns. Oral LD50 for rat of 235 mg/kg; toxic to animals when dose was administered directly into the stomach; unlikely that humans could be exposed to toxic oral dose since liquid TEB is pyrophoric. Inhalation LC50 rat of 700 ppm (four hours exposure), is not defined as toxic or highly toxic via inhalation route; vapour is pyrophoric at 1300 ppm. No dermal toxicity, skin or ocular irritation, or skin sensitization testing reported because exposure to skin and eyes would cause immediate, deep burns and subsequent scarring if not treated immediately. Animals exposed to low non-pyrophoric concentrations of TEB in air became excited and had nasal irritation; at high concentration, some animals frothed at the mouth and/or nose, had convulsions. Death occurred in some animals but not all which showed frothing or had convulsions. Humans would be expected to have irritation of nose, throat, mucous membranes

and central nervous symptoms. Liquid splashed on the skin or in the eyes is expected to cause a fire and burns.

Acute toxicity : LD50 (oral-rat) = 235 mg/kg
LC50 (inh-rat) = 700 ppm/4H

Irritation and corrosion : no data available
Skin corrosion/ irritation : no data available
Serious eye damage/ eye irritation : no data available
Respiratory or skin sensitization : may cause sensitization by skin contact
Germ cell mutagenicity : no data available

Carcinogenicity

IARC: No component of this product contained at levels greater than or equal to 0.1 % is identified as probable, possible or confirmed human carcinogen by IARC.

Reproductive toxicity : no data available

Specific target organ toxicity – single exposure : no data available

Specific target organ toxicity – repeated exposure : no data available

Aspiration hazard : no data available

Route of exposure

- After skin contact : Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Discard contaminated clothing and shoes.
- After eye contact : Immediately flush eyes with plenty of water for at least 15 minutes, holding eyes open.
- After inhalation : Remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen.
- After ingestion : Give two glasses of water and permit vomiting if nauseated. Never give anything by mouth to an unconscious person.

Additional information

RTECS : no data available

12.0 Ecological Information

12.1 Toxicity

no data available

12.2 Persistence and degradability

no data available

12.3 Bioaccumulative potential

no data available

12.4 Mobility in soil

no data available

12.5 Results of PBT and vPvB assessment

no data available

12.6 Other adverse effects

no data available

13.0 Disposal Consideration

Waste treatment methods

Product

Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging

Dispose of as unused product.

14.0 Transport Information**14.1 UN-Number**

UN 2845

14.2 UN proper shipping name

Pyrophoric liquid, organic, n.o.s. (Triethylborane)

14.3 Transport hazard class(es)GGVS/GGVE/ADR/RID: 4.2, Hazard Identification: 333, Classification: S1, Tunnel code:
IMDG/GGVSee-class: 4.2, MFAG: 760, EmS: F-G, S-M, Stowage: D,
ICAO/IATA-class: FORBIDDEN**14.4 Packaging group**

GGVS/GGVE/ADR/RID: I IMO/GGVSee: I ICAO/IATA:

14.5 Environmental hazards

GGVS/GGVE/ADR/RID: no IMO/GGVSee : no ICAO/IATA: no

14.6 Special precautions for users

no data available

15.0 Regulatory Information**15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**

no data available

15.2 Chemical Safety Assessment

no data available

16.0 Other Information

WARNING: This is a Dangerous chemical product. By following the directions and warnings on this material safety data sheet product label and any publication referred to thereon, the danger can be greatly reduced, but never entirely eliminated. AO AVIABOR makes no warranties, expressed or implied, with respect to this product and expressly disclaims the warranty of merchantability and any warranty of fitness for a particular purpose. Users assume all risk in handling, using or storing this product, even if they do so in accordance with the information and instructions given.

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