


MATERIAL SAFETY DATA SHEET (MSDS)
according to Regulation (EC) No. 1907/2006
Version 2.0 Revision Date 01.06.2015

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

- 1.1 Product identifiers** : Trimethylboroxine 50% solution in tetrahydrofuran
EINECS : no data available
CAS : 823-96-1
RTECS : no data available
- 1.2 Relevant identified uses of the substance or mixture and uses advised against**
 Used in preparation of CBS catalysts for asymmetric reductions.
- 1.3 Details of the supplier of the safety data sheet**
 JSC AVIABOR, Nizhny Novgorod Region
 606000 Dzerzhinsk, Russia
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- 1.4 Emergency telephone number:** (+7)-8313-249 750 / 630

2.0 Hazard Identification

- 2.1 Classification of the substance or mixture**
 Colourless to yellow liquid with ethereal odor. Reacts with water without liberate flammable gas, moist air, alcohols and acids. Highly flammable liquid and vapor. Vapor may cause flash fire. Tetrahydrofuran can form explosive peroxides upon store long period in air. The toxicological properties of this material have not been fully investigated. Cause eye, skin and respiratory tract burns. May be absorbed through the skin. May cause liver and kidney effects.
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)
Flam. Liq. 2 Skin Irrit. 2 Eye Dam. 1 STOT SE 3 Carcinogenicity (2)	H225 H315 H318 H335 H351	 Danger	H225 H315 H318 H335 H351	EUH019

- 2.2 Label elements**
- Hazard Statement(s):**
 H315 : Causes skin irritation.
 H318 : Causes serious eye damage.
 H335 : May cause respiratory irritation.
 H225 : Highly flammable liquid and vapor.
 H351 : Suspected of causing cancer.
- Precautionary statement(s):**
 P280 : Wear eye protection/face protection.
 P305 + P351+ P338 : IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 P310 : Immediately call a POISON CENTER or doctor/physician.
 P261 : Avoid breathing dust/fume/gas/mist/vapors/spray.

P302+ P352	: IF ON SKIN: Wash with plenty of soap and water.
P210	: Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P240	: Ground/Bond container and receiving equipment.
Supplemental Hazard information (EU)	
EUH019	: May form explosive peroxides.

3.0 Composition/information on ingredients

Trimethylboroxine

CAS no.	823-96-1
EC no.	None
RTECS#	None
Chemical formula	(CH ₃) ₃ B ₃ O ₃
Percent	~ 50 %
Molar mass	125.54 g/mol
Boiling point	78-80 °C
Classification	Flam. Liq. 2; Skin Irrit. 1B H225, H315

Tetrahydrofuran

CAS no.	109-99-9
EC no.	203-726-8
RTECS#	LU5950000
Chemical formula	C ₄ H ₈ O
Percent	~ 50 %
Molar mass	72.11 g/mol
Boiling point	65-67 °C
Classification	Flam. Liq. 2; Eye Irrit. 2; Carc. 2; STOT SE 3; H225, H319, H335, H351, EUH019

4.0 First Aid Measures

4.1 Description of first aid measures

After skin contact

Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Get medical aid.

After eyes contact

Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

After ingestion

After contamination of the mouth gargle mouth with water and rinse mouth thoroughly at least 15 minutes. If swallowed, do not induce vomiting. Give demulcent such as milk or olive oil in small amounts. Never give anything by mouth to an unconscious person. Get medical aid.

After inhalation

Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

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

Powder extinguisher, inert gas.

Unsuitable extinguishing media

Water, foam, carbon dioxide

5.2 Special hazards arising from the substance or mixture

Development of hazardous combustion gases possible in the event of fire.

5.3 Precautions for fire-fighters

Full protective clothing including protective gloves and boots. For respiratory protection wear a self-contained breathing apparatus 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

Suitable protective clothing.

6.2 Environmental precautions

Do not allow to enter sewerage system.

6.3 Methods and materials for containment and cleaning up

Clean up spills immediately, using non-sparking tools. Collect the sand into a sealed container and take to waste treatment area. Do not get water inside containers. Provide ventilation.

6.4 Reference to other sections

For disposal see section 13.

7.0 Handling and Storage

7.1 Precautions for safe handling

Wash thoroughly after handling. Wash hands before eating. Use with adequate ventilation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Handle under an inert atmosphere. Store protected from air. Do not allow contact with water. Keep from contact with moist air and steam.

7.2 Conditions for safe storage, including any incompatibilities

Keep away from heat and flame. Store in a tightly closed container. Keep under a nitrogen blanket. Store in a cool, dry, well-ventilated area away from incompatible substances. Heat cause pressure build-up inside containers. Do not expose to air. Store protected from moisture. Store under an inert atmosphere. Light sensitive.

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

Refer to section 7.

Personal protective equipment

Normal use & handling

Respiratory - breathing mask

Hand protection - rubber gloves

Eye protection - closely fitting goggles

Skin protection - protective clothing

Emergency handling

Full protective clothing, including gloves and boots, a breathing mask.

Exposure limits

No data available.

Engineering controls

A leakproof system, packless valves, welded piping and other leakproof construction.

Industrial hygiene

During processing ensure efficient exhaust ventilation in the working area. Keep working clothes separate. Wash hands before breaks of the work and after working with the substance. Change contaminated or soaked clothes. Regularly send the clothes to laundry.

Shower after work is obligatory.

9.0 Physical and Chemical Properties

9.1 Information on basic physical and chemical properties**Appearance**

Form: liquid

Odour: ethereal

Colour: colorless to yellow

Safety Related Information

pH

: no data available

Boiling point

: 78-80 °C for trimethylboroxine
65-67 °C for tetrahydrofuran

Flash point

: – 9 °C for trimethylboroxine
– 17 °C for tetrahydrofuran

Flammable limits

: 1.84-11.8% for tetrahydrofuran

Oxidizing properties

: no data available

Explosive properties

: no data available

Lower limit of the melting range

: no data available

Vapour pressure

: 0.173 atm. at 20 °C for tetrahydrofuran

Partition coefficient

: no data available

Viscosity

: no data available

Vapor density

: 2.5 (air = 1) for tetrahydrofuran

Density

: 0.893 g/cm³

Bulk density

: no data available

Decomposition temp

: no data available

Surface tension

: no data available

Conductivity

: no data available

Enthalpy of Vaporization

: no data available

Solubility in water

: hydrolizes

Solubility

: soluble in toluene, tetrahydrofuran

9.2 Other safety information

Ignition temperature

: no data available

Melting point

: – 38 °C for trimethylboroxine
– 108 °C for tetrahydrofuran**10.0 Stability and Reactivity****10.1 Reactivity**

: no data available

10.2 Chemical stability: Stable, light and moisture sensitive.
May form explosive peroxides.**10.3 Possibility of hazardous reactions**

: Reacts with water.

10.4 Conditions to avoid

: See Section 7

10.5 Incompatible materials

: Strong oxidizing agents, acids, bases, moisture

10.6 Hazardous decomposition products

: Boric acid, tetrahydrofuran, methanol

11.0 Toxicological Information**Information on toxicological effects****Acute toxicity**

: no data available

Skin corrosion/ irritation

: no data available

Serious eye damage/ eye irritation

: no data available

Respiratory or skin sensitization

: no data available

Germ cell mutagenicity

: no data available

Carcinogenicity

IARC: No component of this product presents 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

Potential health effects:

Inhalation : May be harmful if inhaled. Causes respiratory tract irritation.

Ingestion : Harmful if swallowed.

Skin : May be harmful if absorbed through skin. Causes skin irritation.

Eyes : Causes eye burns.

Additional Information

RTECS : no data available

12.0 Ecological Information

12.1 Toxicity

not available for the product

For tetrahydrofuran:

LD50 (oral-rat): 1650mg/kg

LC50 (inhalation-rat): 180 mg/L 1 hour
53.9 mg/L 4 hours

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

Dispose of in accordance with local regulations.

Contaminated packaging

Empty containers should be taken to local recyclers for disposal.

14.0 Transport Information

14.1 UN-Number

2924

14.2 UN proper shipping name

Flammable liquid, corrosive, n.o.s. (Trimethylboroxine, tetrahydrofuran)

14.3 Transport hazard class(es)

GGVS/GGVE/ADR/RID: 3(8), Hazard Identification: 338, Classification: FC, Tunnel code: (D/E)

IMO/GGVSee: 3(8), MFAG: 760, EmS: F-E, S-C, Stowage category: B

ICAO/IATA: 3(8), PAX: 352, CAO: 363

14.4 Packaging group

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

14.5 Environmental hazards

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

14.6 Special precautions for user

See section 7.0

14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

The substance is not intended to be transported in bulk.

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

This information is to the best of Aviator's current knowledge and is intended to describe the product only in terms of health and safety and environmental requirements. Since the conditions of use are outside our control, any recommendations or suggestions are made without guarantee and we disclaim any liability for loss or damage suffered from use of this information. Customers must satisfy themselves that the product is suitable for a particular purpose. Furthermore, nothing contained herein shall be construed as a recommendation to use any product in conflict with existing patents. The data does not signify any warranty with regards to the product properties.