

# Safety Data Sheet per OSHA HazCom 2012

Page 1/5 Printing date 11/24/2015 Reviewed on 05/12/2010

#### 1 Identification

Product identifier

Product name: Tetramethylammonium borohydride

Stock number: A17655

**CAS Number:** 16883-45-7

**EC number:** 240-917-5

Relevant identified uses of the substance or mixture and uses advised against.

Identified use: SU24 Scientific research and development

Details of the supplier of the safety data sheet

Details of the supplier of the safety da Manufacturer/Supplier:
Alfa Aesar
Thermo Fisher Scientific Chemicals, Inc. 30 Bond Street
Ward Hill, MA 01835-8099
Tel: 800-343-0660
Fax: 800-322-4757

Email: tech@alfa.com www.alfa.com

Information Department: Health, Safety and Environmental Department

Emergency telephone number:
During normal business hours (Monday-Friday, 8am-7pm EST), call (800) 343-0660. After normal business hours, call Carechem 24 at (866) 928-0789.

#### 2 Hazard(s) identification

Classification of the substance or mixture in accordance with 29 CFR 1910 (OSHA HCS)



GHS02 Flame

Water-react. 2 H261 In contact with water releases flammable gas.



GHS06 Skull and crossbones

Acute Tox. 3 H301 Toxic if swallowed. Acute Tox. 3 H311 Toxic in contact with skin.



GHS05 Corrosion

Skin Corr. 1B H314 Causes severe skin burns and eye damage.

Eye Dam. 1 H318 Causes serious eye damage. Hazards not otherwise classified No information known.

Label elements

GHS label elements The product is classified and labeled in accordance with 29 CFR 1910 (OSHA HCS) Hazard pictograms





GHS02 GHS05 GHS06

Signal word Danger

Hazard statements
H261 In conta

H261 In contact with water releases flammable gas. H301+H311 Toxic if swallowed or in contact with skin. H314 Causes severe skin burns and eye damage.

Precautionary statements

Precautionary statements
Wear protective gloves/protective clothing/eye protection/face protection.
P303+P361+P353 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
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/doctor/...
P370+P378 In case of fire: Use for extinction: Fire-extinguishing powder.
P402+P404 Store in a dry place. Store in a closed container.
WHMIS classification

WHMIS classification

Minio classification

B6 - Reactive flammable material

D1A - Very toxic material causing immediate and serious toxic effects

D2B - Toxic material causing other toxic effects

E - Corrosive material



Classification system HMIS ratings (scale 0-4) (Hazardous Materials Identification System)



PEALTH | 2 | Health (acute effects) = 2 | Flammability = 2 | Flammability = 2 | Physical Hazard = 3

Other hazards Results of PBT and vPvB assessment PBT: Not applicable. vPvB: Not applicable.

USA

# Product name: Tetramethylammonium borohydride

(Contd. of page 1)

#### 3 Composition/information on ingredients

Chemical characterization: Substances CAS# Description: 16883-45-7 Tetramethylammonium borohydride

Identification number(s): EC number: 240-917-5

#### 4 First-aid measures

Description of first aid measures General information

Immediately remove any clothing soiled by the product.
In case of irregular breathing or respiratory arrest provide artificial respiration.

After inhalation
Supply fresh air. If required, provide artificial respiration. Keep patient warm.
Seek immediate medical advice.

Seek Immediate medical advice.

After skin contact

Immediately wash with water and soap and rinse thoroughly.

Seek immediate medical advice.

After eye contact Rinse opened eye for several minutes under running water. Then consult a doctor.

After swallowing Do not induce vomiting; immediately call for medical help.

Information for doctor

Most important symptoms and effects, both acute and delayed Causes severe skin burns.

Causes serious eye damage. Indication of any immediate medical attention and special treatment needed No further relevant information available.

# 5 Fire-fighting measures

Extinguishing media

Suitable extinguishing agents

Suitable extinguishing agents
Dry sand
Extinguishing powder. Do not use water.
For safety reasons unsuitable extinguishing agents Water
Special hazards arising from the substance or mixture
If this product is involved in a fire, the following can be released:
Carbon monoxide and carbon dioxide
Nitrogen oxides (NOx)
Possibly Hydrogen cyanide (HCN)
Boron oxide
Advice for firefighters
Protective equipment:
Wear self-contained respirator.
Wear fully protective impervious suit.

Wear fully protective impervious suit.

## 6 Accidental release measures

Personal precautions, protective equipment and emergency procedures
Wear protective equipment. Keep unprotected persons away.
Ensure adequate ventilation
Keep away from ignition sources
Environmental precautions: Do not allow material to be released to the environment without proper governmental permits.

Methods and material for containment and cleaning up:
Keep away from ignition sources.
Use neutralizing agent.
Dispose of contaminated material as waste according to section 13.

Ensure adequate ventilation. Do not flush with water or aqueous cleansing agents

Prevention of secondary hazards: Keep away from ignition sources.

Reference to other sections
See Section 7 for information on safe handling
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

# 7 Handling and storage

Handling Precautions for safe handling

Handle under dry protective gas.
Keep container tightly sealed.
Store in cool, dry place in tightly closed containers.
Ensure good ventilation at the workplace.
Information about protection against explosions and fires: No information known.

Conditions for safe storage, including any incompatibilities Storage

Requirements to be met by storerooms and receptacles: No special requirements.

Information about storage in one common storage facility: Store away from oxidizing agents. Store away from water/moisture.

Further information about storage conditions:

Store under dry inert gas.
This product is moisture sensitive.
Keep container tightly sealed.
Store in cool, dry conditions in well sealed containers.
Protect from humidity and water.
Specific end use(s) No further relevant information available.

# 8 Exposure controls/personal protection

Additional information about design of technical systems:
Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

Control parameters
Components with limit values that require monitoring at the workplace: Not required.

(Contd. on page 3)

(Contd. of page 2)

### Product name: Tetramethylammonium borohydride

Additional information: No data

Exposure controls
Personal protective equipment
General protective and hygienic measures
The usual precautionary measures for handling chemicals should be followed.
Keep away from foodstuffs, beverages and feed.
Remove all soiled and contaminated clothing immediately.
Wash hands before breaks and at the end of work.
Store protective clothing separately.
Avoid contact with the eyes and skin.
Maintain an ergonomically appropriate working environment.
Breathing equipment: Use suitable respirator when high concentrations are present.
Impervious gloves

Protection of nands:
Impervious gloves
Check protective gloves prior to each use for their proper condition.
The selection of suitable gloves not only depends on the material, but also on quality. Quality will vary from manufacturer to manufacturer.
Penetration time of glove material (in minutes) Not determined
Eye protection:
Tightly sealed goggles
Full face protection:
Penetration is protection.

**Body protection:** Protective work clothing.

#### 9 Physical and chemical properties

Information on basic physical and chemical properties

General Information

Appearance: Form: Color: Crystalline powder White

Odor:

Odorless

Odor threshold:

Not determined.

pH-value:

Not applicable

>250 °C (>482 °F) (dec) Not determined

Change in condition Melting point/Melting range: Boiling point/Boiling range: Sublimation temperature / start:

Not determined

Flash point:

Not applicable Contact with water liberates extremely flammable gases.

Flammability (solid, gaseous) Ignition temperature: Decomposition temperature:

Not determined

Auto igniting:

Not determined Not determined

Danger of explosion: Explosion limits: Lower:

Not determined.

Not determined

Upper: Vapor pressure: Density at 20 °C (68 °F): Relative density

Not determined Not applicable. 0.813 g/cm³ (6.784 lbs/gal) Not determined.

Vapor density Evaporation rate

Not applicable.

Not applicable.

Solubility in / Miscibility with Water:

Contact with water releases flammable gases

Partition coefficient (n-octanol/water): Not determined. Viscosity:

dynamic: kinematic:

Not applicable

Other information

Not applicable. No further relevant information available.

# 10 Stability and reactivity

Reactivity In contact with water releases flammable gases which may ignite spontaneously.

Chemical stability Stable under recommended storage conditions.

Thermal decomposition / conditions to be avoided: Decomposition will not occur if used and stored according to specifications.

Possibility of hazardous reactions Contact with water releases flammable gases

Conditions to avoid No further relevant information available.

Incompatible materials: Oxidizing agents Water/moisture

## Hazardous decomposition products:

Hydrogen Carbon monoxide and carbon dioxide Nitrogen oxides

Boron oxide Possibly Hydrogen cyanide (HCN)

## 11 Toxicological information

Information on toxicological effects

Acute toxicity:
Toxic in contact with skin.
Toxic if swallowed.

Toxic if swallowed.

Danger through skin absorption.

Swallowing will lead to a strong corrosive effect on mouth and throat and to the danger of perforation of esophagus and stomach.

LD/LC50 values that are relevant for classification: No data

Skin irritation or corrosion: Causes severe skin burns.

Eye irritation or corrosion: Causes serious eye damage.

Sensitization: No sensitizing effects known.

Germ cell mutagenicity: No effects known.

Carcinogenicity: No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.

Reproductive toxicity: No effects known.

Specific target organ system toxicity - repeated exposure: No effects known.

Specific target organ system toxicity - repeated exposure: No effects known.

(Contd. on page 4)

(Contd. of page 3)

# Product name: Tetramethylammonium borohydride

Specific target organ system toxicity - single exposure: No effects known. Aspiration hazard: No effects known. Subacute to chronic toxicity: No effects known.

Subacute to chronic toxicity:

Boron affects the central nervous system. Boron poisoning causes depression of the circulation, persistant vomiting and diarrhea, followed by profound shock and coma. The temperature may become subnormal and a scarletina form rash may cover the entire body.

Additional toxicological information: To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.

UN3131

#### 12 Ecological information

Toxicity
Aquatic toxicity: No further relevant information available.
Persistence and degradability No further relevant information available.
Bioaccumulative potential No further relevant information available.
Mobility in soil No further relevant information available.
Additional ecological information:
General notes:

General notes:
Do not allow material to be released to the environment without proper governmental permits.

Do not allow undiluted product or large quantities to reach ground water, water course or sewage system. Avoid transfer into the environment.

Results of PBT and vPvB assessment PBT: Not applicable.

vPvB: Not applicable

Other adverse effects No further relevant information available.

#### 13 Disposal considerations

Waste treatment methods

Recommendation Consult state, local or national regulations to ensure proper disposal.

Uncleaned packagings:
Recommendation: Disposal must be made according to official regulations.

14	Transport i	nformation
	LINI Nivember	

DOT, IMDG, IATA	
UN proper shipping name	

IMDG, IATA

Water-reactive solid, corrosive, n.o.s. (Tetramethylammonium borohydride) WATER-REACTIVE SOLID, CORROSIVE, N.O.S. (Tetramethylammonium borohydride)

4.3 Substances which, in contact with water, emit flammable gases. 4.3+8 4.3 (WC2) Substances which, in contact with water, emit flammable gases 4.3+8

4.3 Substances which, in contact with water, emit flammable gases.

#### Transport hazard class(es)

DOT





Class Label Class

Label IMDG, IATA







Packing group DOT, IMDG, IATA

Environmental hazards:

Special precautions for user

Not applicable. Warning: Substances which, in contact with water, emit flammable gases

Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code Not applicable. Transport/Additional information:

DOT

Marine Pollutant (DOT):

UN "Model Regulation":

4.3+8

UN3131, Water-reactive solid, corrosive, n.o.s. (Tetramethylammonium borohydride), 4.3 (8), II

# 15 Regulatory information

Safety, health and environmental regulations/legislation specific for the substance or mixture GHS label elements The product is classified and labeled in accordance with 29 CFR 1910 (OSHA HCS) Hazard pictograms







GHS02 GHS05 GHS06

Signal word Danger

Hazard statements
H261 In contact with water releases flammable gas.
H301+H311 Toxic if swallowed or in contact with skin.
H314 Causes severe skin burns and eye damage.
Precautionary statements

Wear protective gloves/protective clothing/eye protection/face protection.
P303+P361+P353 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
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/doctor/...

(Contd. on page 5)

# Product name: Tetramethylammonium borohydride

In case of fire: Use for extinction: Fire-extinguishing powder. Store in a dry place. Store in a closed container. P370+P378

(Contd. of page 4)

P402+P404

P402+P404 Store in a dry place. Store in a closed container.

National regulations

All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.

All components of this product are listed on the Canadian Non-Domestic Substances List (NDSL).

SARA Section 313 (specific toxic chemical listings) Substance is not listed.

California Proposition 65

Prop 65 - Chemicals known to cause cancer Substance is not listed.

Prop 65 - Developmental toxicity Substance is not listed.

Prop 65 - Developmental toxicity, female Substance is not listed.

Prop 65 - Developmental toxicity, male Substance is not listed.

Information about limitation of use: For use only by technically qualified individuals.

Other regulations, limitations and prohibitive regulations

Substance of Very High Concern (SVHC) according to the REACH Regulations (EC) No. 1907/2006. Substance is not listed.

The conditions of restrictions according to Article 67 and Annex XVII of the Regulation (EC) No 1907/2006 (REACH) for the manufacturing, placing on the market and use must be observed.

market and use must be observed.

Substance is not listed.

Annex XIV of the REACH Regulations (requiring Authorisation for use) Substance is not listed.

Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

#### 16 Other information

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

Conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

Department issuing SDS: Global Marketing Department
Date of preparation / last revision 11/24/2015 / Abbreviations and acronyms:

RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
IATA-DGR: Dangerous Goods Regulations by the "International Air Transport Association" (IATA)
ICAO: International Civil Aviation Organization
ICAO: International Instructions by the "International Civil Aviation Organization" (ICAO)
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
HMIS: Hazardous Materials Information System (USA)
WHMIS: Workplace Hazardous Materials Information System (Canada)
LC50: Lethal done, 50 percent
LD50: Lethal done, 60 percent
LD50: Lethal done, 50 percent
LD50: Armerican Conference of Governmental Industrial Hygienists (USA)
OSHA: Occupational Safety and Health Administration (USA)
NTP: National Toxicology Program (USA)
IARC: International Agency (Por Research on Cancer
EPA: Environmental Protection Agency (USA)

USA