1 Identification

Product identifier

Product name: 2-Methyl-5-pyridylzinc bromide, 0.5M in THF

Stock number: H58043
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
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

Flam. Liq. 2 H225 Highly flammable liquid and vapor.
Water-react. 2 H261 In contact with water releases flammable gas.

GHS08 Health hazard

Carc. 2 H351 Suspected of causing cancer.

GHS05 Corrosion

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

GHS07

STOT SE 3 H335 May cause respiratory irritation.
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 GHS07 GHS08

Signal word Danger

Hazard-determining components of labeling:
Tetrahydrofuran
2-Methyl-5-pyridylzinc bromide
Hazard statements
H225 Highly flammable liquid and vapor.
H261 In contact with water releases flammable gas.
H314 Causes severe skin burns and eye damage.
H351 Suspected of causing cancer.
H335 May cause respiratory irritation.
Precautionary statements
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P231+P232 Handle under inert gas. Protect from moisture.
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.
P405 Store locked up.
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.
WHMIS classification
B2 - Flammable liquid
B6 - Reactive flammable material
D2B - Toxic material causing other toxic effects
E - Corrosive material

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

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

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

(Contd. on page 2)

Product name: 2-Methyl-5-pyridylzinc bromide, 0.5M in THF

(Contd. of page 1)

vPvB: Not applicable.

3 Composition/information on ingredients

Chemical characterization: Mixtures

Dangerous components:

109-99-9	Tetrahydrofuran	Flam. Liq. 2, H225; Carc. 2, H351; Eye Irrit. 2, H319; STOT SE 3, H335	87.64%
	2-Methyl-5-pyridylzinc bromide	Water-react. 1, H260; Skin Corr. 1B, H314; Eye Dam. 1, H318	12.36%

Additional information None known.

4 First-aid measures

Description of first aid measures
General information Immediately remove any clothing soiled by the product.
After inhalation
Supply fresh air. If required, provide artificial respiration. Keep patient warm.
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 Seek medical treatment.
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 In case of fire, use sand, carbon dioxide or powdered extinguishing agent. Never 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)
Hydrogen bromide (HBr)
Zinc oxide
Advice for firefighters
Protective equipment:
Wear self-contained respirator.
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 product to reach sewage system or any water course.
Methods and material for containment and cleaning up:
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
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.
Ensure good ventilation at the workplace.
Open and handle container with care.
Reacts violently with water
Information about protection against explosions and fires:
Protect against electrostatic charges.
Fumes can combine with air to form an explosive mixture.
Keep ignition sources away.
Do not distill to dryness.
Explosive peroxides may form, handle container cautiously.

Conditions for safe storage, including any incompatibilities
Storage
Requirements to be met by storerooms and receptacles: Refrigerate
Information about storage in one common storage facility:
Store away from air.
Protect from heat.
Store away from water/moisture.
Do not store together with acids.
Store away from oxidizing agents.
Store away from acid chlorides.
Further information about storage conditions:
Store under dry inert gas.
This product is air sensitive.
Protect from humidity and water.
Avoid contact with air/oxygen (formation of peroxide).
Refrigerate

(Contd. on page 3)

Product name: 2-Methyl-5-pyridylzinc bromide, 0.5M in THF

(Contd. of page 2)

Check container pressure periodically to prevent explosive peroxides.
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:

109-99-9 Tetrahydrofuran (87.64%)

PEL (USA)	Long-term value: 590 mg/m³, 200 ppm
REL (USA)	Short-term value: 735 mg/m³, 250 ppm Long-term value: 590 mg/m³, 200 ppm
TLV (USA)	Short-term value: 295 mg/m³, 100 ppm Long-term value: 147 mg/m³, 50 ppm Skin
EL (Canada)	Short-term value: 100 ppm Long-term value: 50 ppm Skin
EV (Canada)	Short-term value: 100 ppm Long-term value: 50 ppm Skin

Ingredients with biological limit values:

109-99-9 Tetrahydrofuran (87.64%)

BEI (USA)	2 mg/L Medium: urine Time: end of shift Parameter: Tetrahydrofuran

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.
Do not inhale dust / smoke / mist.
Avoid contact with the eyes and skin.
Maintain an ergonomically appropriate working environment.
Breathing equipment: Use suitable respirator when high concentrations are present.
Recommended filter device for short term use:
Use a respirator with organic vapor/acid gas cartridges as a backup to engineering controls. Risk assessment should be performed to determine if air-purifying respirators are appropriate. Only use equipment tested and approved under appropriate government standards such as NIOSH (USA) or CEN (EU).
Protection of hands:
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
Body protection: Protective work clothing.

9 Physical and chemical properties

Information on basic physical and chemical properties
General Information
Appearance:

Form:	Liquid
Color:	Yellow to brown to black
Odor:	Not determined
Odor threshold:	Not determined.
pH-value:	Not determined.
Change in condition	
Melting point/Melting range:	Not determined
Boiling point/Boiling range:	66 °C (151 °F) (THF)
Sublimation temperature / start:	Not determined
Flash point:	-17 °C (1 °F) (THF)
Flammability (solid, gaseous)	Not determined.
Ignition temperature:	321 °C (610 °F) (THF)
Decomposition temperature:	Not determined
Auto igniting:	Product is not selfigniting.
Danger of explosion:	May form explosive peroxides. Do not distill to dryness.
Explosion limits:	
Lower:	2.0 Vol % (THF)
Upper:	11.8 Vol % (THF)
Vapor pressure at 20 °C (68 °F):	200 hPa (150 mm Hg) (THF)
Density:	Not determined
Relative density	Not determined.
Vapor density	Not determined.
Evaporation rate	Not determined.
Solubility in / Miscibility with	
Water:	Contact with water releases flammable gases
Partition coefficient (n-octanol/water):	Not determined.
Viscosity:	
dynamic:	Not determined.
kinematic:	Not determined.

(Contd. on page 4)

Product name: 2-Methyl-5-pyridylzinc bromide, 0.5M in THF

(Contd. of page 3)

Solvent content:	
Organic solvents:	87.6 %
Solids content:	12.4 %
Other information	No further relevant information available.
Additional information	This product may form a precipitate.

10 Stability and reactivity

Reactivity
In contact with water releases flammable gases which may ignite spontaneously.
May form explosive peroxides.
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
Reacts with strong oxidizing agents
Contact with water releases flammable gases
May form explosive peroxides.
Conditions to avoid No further relevant information available.
Incompatible materials:
Acids
Air
Oxidizing agents
Acid chlorides
Heat
Water/moisture
Hazardous decomposition products:
Carbon monoxide and carbon dioxide
Zinc oxide
Hydrogen bromide
Nitrogen oxides
Additional information: This product may form a precipitate.

11 Toxicological information

Information on toxicological effects
Acute toxicity:
Swallowing will lead to a strong corrosive effect on mouth and throat and to the danger of perforation of esophagus and stomach.
The Registry of Toxic Effects of Chemical Substances (RTECS) contains acute toxicity data for components in this product.

LD/LC50 values that are relevant for classification:

109-99-9 Tetrahydrofuran

Oral	LD50	1650 mg/kg (rat)
Inhalative	LC50/2H	72000 mg/m3/2H (rat)

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:
Suspected of causing cancer.
EPA-S: Suggestive evidence of carcinogenicity, but not sufficient to assess human carcinogenic potential.
ACGIH A3: Animal carcinogen: Agent is carcinogenic in experimental animals at a relatively high dose, by route(s) of administration, at site(s), of histologic type(s), or by mechanism(s) not considered relevant to worker exposure. Available epidemiologic studies do not confirm an increased risk of cancer in exposed humans. Available evidence suggests that the agent is not likely to cause cancer in humans except under uncommon or unlikely routes or levels of exposure.
Reproductive toxicity: No effects known.
Specific target organ system toxicity - repeated exposure: No effects known.
Specific target organ system toxicity - single exposure: May cause respiratory irritation.
Aspiration hazard: No effects known.
Subacute to chronic toxicity: The Registry of Toxic Effects of Chemical Substances (RTECS) contains multiple dose toxicity data for this substance.
Additional toxicological information:
To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.
The product shows the following dangers according to internally approved calculation methods for preparations:
Corrosive
Irritant

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:
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 information

UN-Number	
DOT, IMDG, IATA	UN3399

(Contd. on page 5)

Product name: 2-Methyl-5-pyridylzinc bromide, 0.5M in THF

(Contd. of page 4)

UN proper shipping name
DOT Organometallic substance, liquid, water-reactive, flammable (3,4-Difluorobenzylzinc bromide, Tetrahydrofuran)
IMDG, IATA ORGANOMETALLIC SUBSTANCE, LIQUID, WATER-REACTIVE, FLAMMABLE (3,4-Difluorobenzylzinc bromide, TETRAHYDROFURAN)

Transport hazard class(es)
DOT

Class 4.3 Substances which, in contact with water, emit flammable gases.
Label 4.3+3
Class 4.3 (WF1) Substances which, in contact with water, emit flammable gases
Label 4.3+3
IMDG, IATA

Class 4.3 Substances which, in contact with water, emit flammable gases.
Label 4.3+3

Packing group
DOT, IMDG, IATA II

Environmental hazards:
Marine pollutant (IMDG): No

Special precautions for user Warning: Substances which, in contact with water, emit flammable gases
EMS Number: F-G,S-N

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

Transport/Additional information:
DOT
Marine Pollutant (DOT): No

UN "Model Regulation": UN3399, Organometallic substance, liquid, water-reactive, flammable (3,4-Difluorobenzylzinc bromide, Tetrahydrofuran), 4.3 (3), 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 GHS07 GHS08

Signal word Danger

Hazard-determining components of labeling:
Tetrahydrofuran
2-Methyl-5-pyridylzinc bromide
Hazard statements
H225 Highly flammable liquid and vapor.
H261 In contact with water releases flammable gas.
H314 Causes severe skin burns and eye damage.
H351 Suspected of causing cancer.
H335 May cause respiratory irritation.
Precautionary statements
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P231+P232 Handle under inert gas. Protect from moisture.
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.
P405 Store locked up.
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.
National regulations
This product is not listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical Substance Inventory. Use of this product is restricted to research and development only. This product must be used by or directly under the supervision of a technically qualified individual as defined by TSCA. This product must not be used for commercial purposes or in formulations for commercial purposes.
Some or all of the components of this product are not listed on the Canadian Domestic Substances List (DSL) or the Canadian Non-Domestic Substances List (NDSL).

SARA Section 313 (specific toxic chemical listings)

109-99-9	Tetrahydrofuran	87.64%

California Proposition 65

Prop 65 - Chemicals known to cause cancer
None of the ingredients are listed.

Prop 65 - Developmental toxicity
None of the ingredients are listed.

Prop 65 - Developmental toxicity, female
None of the ingredients are listed.

Prop 65 - Developmental toxicity, male
None of the ingredients are listed.

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

(Contd. on page 6)

Product name: 2-Methyl-5-pyridylzinc bromide, 0.5M in THF

(Contd. of page 5)

Other regulations, limitations and prohibitive regulations

Substance of Very High Concern (SVHC) according to the REACH Regulations (EC) No. 1907/2006.

None of the ingredients are 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.

None of the ingredients is listed.

Annex XIV of the REACH Regulations (requiring Authorisation for use)

None of the ingredients is 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.

Department issuing SDS: Global Marketing Department
Date of preparation / last revision 11/24/2015 / -
Abbreviations and acronyms:
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
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
HMIS: Hazardous Materials Identification System (USA)
WHMIS: Workplace Hazardous Materials Information System (Canada)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
vPvB: very Persistent and very Bioaccumulative
ACGIH: American Conference of Governmental Industrial Hygienists (USA)
OSHA: Occupational Safety and Health Administration (USA)
NTP: National Toxicology Program (USA)
IARC: International Agency for Research on Cancer
EPA: Environmental Protection Agency (USA)