

**SECTION 1: Identification of the substance/mixture and of the company/undertaking****1.1 Product identifier**

Trade name

***Nysted Reagent, 20% w/w suspension in THF***

Stock number:

H56963

**1.2 Relevant identified uses of the substance**

or mixture and uses advised against.

No further relevant information available.  
SU24 Scientific research and development

Identified use:

**1.3 Details of the supplier of the safety data sheet**

Manufacturer/Supplier:

Alfa Aesar GmbH & Co.KG  
A Johnson Matthey Company  
Zeppelinstr. 7b  
76185 Karlsruhe / Germany  
Tel: +49 (0) 721 84007 280  
Fax: +49 (0) 721 84007 300  
Email: tech@alfa.com  
www.alfa.com

Informing department:

Product safety Tel + +049 (0) 7275 988687-0

1.4 Emergency telephone number:

Carechem 24: +44 (0) 1235 239 670 (Multi-language emergency number)

Poison Information Center Mainz

www.giftinfo.uni-mainz.de Telephone: +49(0)6131/19240

**SECTION 2: Hazards identification****2.1 Classification of the substance or mixture**

Classification according to Regulation (EC) No 1272/2008



GHS02 flame

Flam. Liq. 2 H225 Highly flammable liquid and vapour.

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



GHS08 health hazard

Carc. 2 H351 Suspected of causing cancer.



GHS07

Acute Tox. 4 H302 Harmful if swallowed.

Skin Irrit. 2 H315 Causes skin irritation.

Eye Irrit. 2 H319 Causes serious eye irritation.

STOT SE 3 H335 May cause respiratory irritation.

**Classification according to Directive 67/548/EEC or Directive 1999/45/EC**

Xn; Harmful

R22: Harmful if swallowed.

Xi; Irritant

R36/37/38: Irritating to eyes, respiratory system and skin.

F; Highly flammable

R11: Highly flammable.

R14-19: Reacts violently with water. May form explosive peroxides.

**Information concerning particular hazards for human and environment:**

The product has to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.

**Other hazards that do not result in classification**

No information known.

**2.2 Label elements**

Labelling according to Regulation (EC) No 1272/2008

Hazard pictograms

The product is classified and labelled according to the CLP regulation.

Signal word

GHS02, GHS07, GHS08  
Danger

Hazard-determining components of labelling:

cyclo-Dibromodi- $\mu$ -methylene[ $\mu$ -(tetrahydrofuran)]trizinc  
Tetrahydrofuran

Hazard statements

H225 Highly flammable liquid and vapour.  
H261 In contact with water releases flammable gases.  
H302 Harmful if swallowed.  
H315 Causes skin irritation.  
H319 Causes serious eye irritation.  
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): Remove/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.

Additional information:

EUH014 Reacts violently with water.  
EUH019 May form explosive peroxides.**2.3 Other hazards**

Results of PBT and vPvB assessment

PBT:

Not applicable.

vPvB:

Not applicable.

**SECTION 3: Composition/information on ingredients****3.2 Mixtures**

Dangerous components:

**Safety data sheet**  
according to 1907/2006/EC, Article 31

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Printing date 15.07.2013

**Trade name Nysted Reagent, 20% w/w suspension in THF**

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CAS: 109-99-9 EINECS: 203-726-8	Tetrahydrofuran Xn R40; Xi R36/37; F R11 R19 Flam. Liq. 2, H225; Carc. 2, H351; Eye Irrit. 2, H319; STOT SE 3, H335	80,0%
CAS: 41114-59-4	cyclo-Dibromodi-μ-methylen[e-(tetrahydrofuran)]trizinc T R25; Xi R36/37/38; F R11 R14 Flam. Liq. 1, H224; Acute Tox. 3, H301; Skin Irrit. 2, H315; Eye Irrit. 2, H319; STOT SE 3, H335	20,0%

**Additional information** None known.

**SECTION 4: First aid measures**
**4.1 Description of first aid measures**
**After inhalation**

Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist.

**After skin contact**

 Seek immediate medical advice.  
Instantly wash with water and soap and rinse thoroughly.

**After eye contact**

Seek immediate medical advice.

**After swallowing**

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

**4.2 Most important symptoms and effects, both acute and delayed**

No further relevant information available.

**4.3 Indication of any immediate medical attention and special treatment needed**

No further relevant information available.

**SECTION 5: Firefighting measures**
**5.1 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.

**5.2 Special hazards arising from the substance or mixture**

 Reacts violently with water  
If this product is involved in a fire, the following can be released:  
Carbon monoxide and carbon dioxide  
Hydrogen bromide (HBr)  
Metal oxide

**5.3 Advice for firefighters**
**Protective equipment:**

 Wear self-contained breathing apparatus.  
Wear full protective suit.

**SECTION 6: Accidental release measures**
**6.1 Personal precautions, protective equipment and emergency procedures**

 Wear protective equipment. Keep unprotected persons away.  
Ensure adequate ventilation  
Keep away from ignition sources

**6.2 Environmental precautions:**

 Do not allow material to be released to the environment without proper governmental permits.  
Do not allow product to reach sewage system or water bodies.  
Do not allow to enter the ground/soil.

**6.3 Methods and material for containment and cleaning up:**

 Keep away from ignition sources.  
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).  
Dispose of contaminated material as waste according to item 13.  
Ensure adequate ventilation.

**Prevention of secondary hazards:**
**6.4 Reference to other sections**

 Do not flush with water or aqueous cleansing agents  
Keep away from ignition sources.  
See Section 7 for information on safe handling  
See section 8 for information on personal protection equipment.  
See Section 13 for information on disposal.

**SECTION 7: Handling and storage**
**7.1 Precautions for safe handling**

 Handle under dry protective gas.  
Keep containers tightly sealed.  
Store in cool, dry place in tightly closed containers.  
Ensure good ventilation/exhaustion at the workplace.  
Open and handle container with care.

**Information about protection against explosions and fires:**

 Protect against electrostatic charges.  
Fumes can combine with air to form an explosive mixture.  
Do not distill to dryness.  
Explosive peroxides may form, handle container cautiously.

**7.2 Conditions for safe storage, including any incompatibilities**
**Storage Requirements to be met by storerooms and containers:**

Store in cool location.

**Information about storage in one common storage facility:**

 Store away from air.  
Store away from water.  
Store away from oxidizing agents.

**Further information about storage conditions:**

 Store under dry inert gas.  
This product is moisture sensitive.  
This product is air sensitive.  
Protect from humidity and keep away from water.  
Store in cool, dry conditions in well sealed containers.  
Avoid contact with air / oxygen (formation of peroxide).  
Check container pressure periodically to prevent explosive peroxides.  
No further relevant information available.

**7.3 Specific end use(s)**
**SECTION 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.

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**8.1 Control parameters****Components with critical values that require monitoring at the workplace:****109-99-9 Tetrahydrofuran (80,0%)**

AGW (Germany)	150 mg/m <sup>3</sup> , 50 ppm 2(l);DFG, EU, H, Y
PEL (USA)	590 mg/m <sup>3</sup> , 200 ppm
REL (USA)	Short-term value: 735 mg/m <sup>3</sup> , 250 ppm Long-term value: 590 mg/m <sup>3</sup> , 200 ppm
TLV (USA)	Short-term value: 295 mg/m <sup>3</sup> , 100 ppm Long-term value: 147 mg/m <sup>3</sup> , 50 ppm Skin

**Ingredients with biological limit values:****109-99-9 Tetrahydrofuran (80,0%)**

BGW (Germany)	2 mg/l U b Tetrahydrofuran
BEI (USA)	2 mg/L urine end of shift Tetrahydrofuran

**Additional information:** No data**8.2 Exposure controls****Personal protective equipment  
General protective and hygienic measures**

The usual precautionary measures should be adhered to in handling the chemicals.  
Keep away from foodstuffs, beverages and food.  
Instantly remove any soiled and impregnated garments.  
Wash hands during breaks and at the end of the work.  
Avoid contact with the eyes and skin.  
Maintain an ergonomically appropriate working environment.

**Breathing equipment:****Protection of hands:**

Use breathing protection with high concentrations.  
Check protective gloves prior to each use for their proper condition.  
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

**Material of gloves****Penetration time of glove material****Eye protection:**

Impervious gloves  
Not determined  
Safety glasses  
Full face protection  
Protective work clothing.

**Body protection:****SECTION 9: Physical and chemical properties****9.1 Information on basic physical and chemical properties****General Information****Appearance:**

<b>Form:</b>	Liquid
<b>Smell:</b>	Not determined
<b>Odour threshold:</b>	Not determined.

**pH-value:** Not determined.**Change in condition**

<b>Melting point/Melting range:</b>	Not determined
<b>Boiling point/Boiling range:</b>	Not determined
<b>Sublimation temperature / start:</b>	Not determined

<b>Flash point:</b>	-26 °C
<b>Inflammability (solid, gaseous)</b>	Not determined.
<b>Ignition temperature:</b>	230 °C
<b>Decomposition temperature:</b>	Not determined
<b>Self-inflammability:</b>	Product is not selfigniting.

**Danger of explosion:** May form explosive peroxides.  
Do not distill to dryness.**Critical values for explosion:**

<b>Lower:</b>	1,5 Vol %
<b>Upper:</b>	12,0 Vol %
<b>Steam pressure at 20 °C:</b>	200 hPa
<b>Density at 20 °C</b>	1,186 g/cm <sup>3</sup>
<b>Relative density</b>	Not determined.
<b>Vapour density</b>	Not determined.
<b>Evaporation rate</b>	Not determined.
<b>Solubility in / Miscibility with</b>	
<b>Water:</b>	Reacts violently
<b>Partition coefficient (n-octanol/water):</b>	Not determined.
<b>Viscosity:</b>	
<b>dynamic:</b>	Not determined.
<b>kinematic:</b>	Not determined.

**Solvent content:**  
**Organic solvents:** 80,0 %**Solids content:** 20,0 %**9.2 Other information** No further relevant information available.**SECTION 10: Stability and reactivity****10.1 Reactivity**

Reacts violently with water.  
May form explosive peroxides.  
Stable under recommended storage conditions.

**10.2 Chemical stability****Thermal decomposition / conditions to be avoided:**

No decomposition if used and stored according to specifications.

**10.3 Possibility of hazardous reactions**

Reacts with strong oxidizing agents  
Reacts violently with water  
Forms peroxides

**10.5 Incompatible materials:**

Air  
Oxidizing agents  
Water/moisture

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**10.6 Hazardous decomposition products:** Carbon monoxide and carbon dioxide  
Hydrogen bromide  
Metal oxide

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**SECTION 11: Toxicological information**
**11.1 Information on toxicological effects**

**Acute toxicity:** Harmful if swallowed.  
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/m <sup>3</sup> /2H (rat)

**Skin irritation or corrosion:** Causes skin irritation.  
**Eye irritation or corrosion:** Causes serious eye irritation.  
**Sensitization:** No sensitizing effect known.  
**Germ cell mutagenicity:** The Registry of Toxic Effects of Chemical Substances (RTECS) contains mutation data for components in this product.  
**Carcinogenicity:** 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. The Registry of Toxic Effects of Chemical Substances (RTECS) contains tumorigenic and/or carcinogenic and/or neoplastic data for this product.  
**Reproductive toxicity:** The Registry of Toxic Effects of Chemical Substances (RTECS) contains reproductive data for components in this product.  
**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.  
**Experience with humans:** The Registry of Toxic Effects of Chemical Substances (RTECS) contains multiple dose toxicity data for components in this product.  
**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 the calculation method of the General EC Classification Guidelines for Preparations as issued in the latest version:  
Harmful  
Irritant

**SECTION 12: Ecological information**

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

Do not allow material to be released to the environment without proper governmental permits.  
Water hazard class 1 (Self-assessment): slightly hazardous for water.  
Do not allow undiluted product or large quantities of it to reach ground water, water bodies or sewage system.  
Avoid transfer into the environment.

**12.5 Results of PBT and vPvB assessment**  
**PBT:** Not applicable.  
**vPvB:** Not applicable.  
**12.6 Other adverse effects**  
No further relevant information available.

**SECTION 13: Disposal considerations**
**13.1 Waste treatment methods**

**Recommendation:** Hand over to disposers of hazardous waste.  
Must be specially treated under adherence to official regulations.  
Consult state, local or national regulations for proper disposal.

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

**SECTION 14: Transport information**

**UN-Number**  
**ADR, IMDG, IATA** UN3399

**14.2 UN proper shipping name**  
**ADR** 3399 ORGANOMETALLIC SUBSTANCE, LIQUID, WATER-REACTIVE, FLAMMABLE  
**IMDG, IATA** ORGANOMETALLIC SUBSTANCE, LIQUID, WATER-REACTIVE, FLAMMABLE

**14.3 Transport hazard class(es)**

**ADR**

**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** II  
**ADR, IMDG, IATA**

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**14.5 Environmental hazards:****Marine pollutant:** No**14.6 Special precautions for user****Kemler Number:** Warning: Substances which, in contact with water, emit flammable gases.**14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**

Code Not applicable.

**Transport/Additional information:****ADR****Excepted quantities (EQ):** E2**Limited quantities (LQ)** 500 ml**Transport category** 0**Tunnel restriction code** D/E**UN "Model Regulation":** UN3399, ORGANOMETALLIC SUBSTANCE, LIQUID, WATER-REACTIVE, FLAMMABLE, 4.3 (3), II**SECTION 15: Regulatory information****15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture****Australian Inventory of Chemical Substances**

109-99-9 | Tetrahydrofuran

**Standard for the Uniform Scheduling of Drugs and Poisons**

None of the ingredients is listed.

**National regulations****Information about limitation of use:**For use only by technically qualified individuals.  
Employment restrictions concerning young persons must be observed.**Classification according to VbF:** A I**Technical instructions (air):**

Class	Share in %
NK	80,0

**Water hazard class:**

Water hazard class 1 (Self-assessment): slightly hazardous for water.

**Other regulations, limitations and prohibitive regulations****ELINCS (European List of Notified Chemical Substances)**

None of the ingredients is listed.

**Substances of very high concern (SVHC) according to REACH, Article 57**

None of the ingredients are listed.

**REACH - Pre-registered substances**

109-99-9 | Tetrahydrofuran

**15.2 Chemical safety assessment:**

A Chemical Safety Assessment has not been carried out.

**SECTION 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.

**Relevant phrases**

H224	Extremely flammable liquid and vapour.
H225	Highly flammable liquid and vapour.
H301	Toxic if swallowed.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
H351	Suspected of causing cancer.
R11	Highly flammable.
R14	Reacts violently with water.
R19	May form explosive peroxides.
R25	Toxic if swallowed.
R36/37	Irritating to eyes and respiratory system.
R36/37/38	Irritating to eyes, respiratory system and skin.
R40	Limited evidence of a carcinogenic effect.

**Department issuing SDS:**

Health, Safety and Environmental Department.

**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  
 IATA: International Air Transport Association  
 GHS: Globally Harmonized System of Classification and Labelling of Chemicals  
 VbF: Verordnung über brennbare Flüssigkeiten, Österreich (Ordinance on the storage of combustible liquids, Austria)  
 LC50: Lethal concentration, 50 percent  
 LD50: Lethal dose, 50 percent

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