

# Safety data sheet

according to 1907/2006/EC, Article 31

Revision: 10.10.2005

Printing date 01.07.2013

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

Trade name

**Diisobutylaluminum, 25% w/w in hexane**

Stock number:

89039

CAS Number:

1779-25-5

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

Identified use:

SU24 Scientific research and development

**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. 1 H224 Extremely flammable liquid and vapour.

Water-react. 1 H260 In contact with water releases flammable gases which may ignite spontaneously.



GHS08 health hazard

Repr. 2 H361 Suspected of damaging fertility or the unborn child.

STOT RE 2 H373 May cause damage to the peripheral nervous system, the lung, the kidneys, the liver, the reproductive system and the brain through prolonged or repeated exposure. Route of exposure: Inhalative.

Asp. Tox. 1 H304 May be fatal if swallowed and enters airways.



GHS05 corrosion

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



GHS09 environment

Aquatic Chronic 2 H411 Toxic to aquatic life with long lasting effects.



GHS07

STOT SE 3 H336 May cause drowsiness or dizziness.

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

C; Corrosive

R34: Causes burns.



Xn; Harmful

R48/20-62-65: Harmful: danger of serious damage to health by prolonged exposure through inhalation. Possible risk of impaired fertility. Harmful: may cause lung damage if swallowed.



F; Highly flammable

R11: Highly flammable.



N; Dangerous for the environment

R51/53: Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

R14-67: Reacts violently with water. Vapours may cause drowsiness and dizziness.

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

Has a narcotizing effect.

**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

Signal word

Hazard statements

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

GHS02, GHS05, GHS07, GHS08, GHS09

Danger

H224 Extremely flammable liquid and vapour.

H260 In contact with water releases flammable gases which may ignite spontaneously.

H314 Causes severe skin burns and eye damage.

H361 Suspected of damaging fertility or the unborn child.

H336 May cause drowsiness or dizziness.

H373 May cause damage to the peripheral nervous system, the lung, the kidneys, the liver, the reproductive system and the brain through prolonged or repeated exposure. Route of exposure: Inhalative.

H304 May be fatal if swallowed and enters airways.

H411 Toxic to aquatic life with long lasting effects.

P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.

P301+P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.

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.

EUH014 Reacts violently with water.

**Precautionary statements****Additional information:****2.3 Other hazards**

Results of PBT and vPvB assessment

PBT:

Not applicable.

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vPvB: Not applicable.

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

**3.1 Substances**  
**CAS# Designation:** 1779-25-5 Diisobutylaluminum, 25% w/w in hexane

**SECTION 4: First aid measures**

**4.1 Description of first aid measures**  
**General information**  
**After inhalation**

Instantly remove any clothing soiled by the product.  
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.  
Rinse opened eye for several minutes under running water. Then consult doctor.

**After swallowing**

Seek medical treatment.

**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**  
**For safety reasons unsuitable extinguishing agents**

Extinguishing powder. Do not use water.

Carbon dioxide  
Water.

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

Reacts violently with water  
Substance/product is auto-flammable.  
If this product is involved in a fire, the following can be released:  
Hydrogen chloride (HCl)  
Carbon monoxide and carbon dioxide  
Inflammable gases/vapours  
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

**6.2 Environmental precautions:**

Keep away from ignition sources  
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).  
Use neutralizing agent.  
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.

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

Protect against electrostatic charges.  
Fumes can combine with air to form an explosive mixture.

**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.

**Further information about storage conditions:**

Store under dry inert gas.  
This product is moisture sensitive.  
This product is air sensitive.  
Avoid contact with air / oxygen.  
Protect from humidity and keep away from water.  
Keep container tightly sealed.  
Store in cool, dry conditions in well sealed containers.  
Store in a locked cabinet or with access restricted to technical experts or their assistants.  
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.

**8.1 Control parameters**

**Components with critical values that require monitoring at the workplace:**

Aluminum alkyls  
mg/m3

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Belgium TWA 5  
 BC Canada TWA 2  
 Ireland TWA 2.5  
 Quebec Canada TWA 2  
 United Kingdom TWA 2

n-Hexane

ppm

ACGIH TLV 50 (skin)  
 Austria MAK 50  
 Belgium TWA 50  
 Denmark TWA 25  
 Finland TWA 50; 150-STEEL  
 France VME 50  
 Germany MAK 50  
 Hungary TWA 100; 200-STEEL  
 Japan OEL 40 (skin)  
 Korea TLV 50 (skin)  
 Netherlands MAC-TGG 25  
 Norway TWA 25  
 Poland TWA 100; 400-STEEL  
 Russia TWA 40; 300-STEEL  
 Sweden NGV 25; 50-KTV  
 Switzerland MAK-W 50; 100-KZG-W  
 United Kingdom TWA 20  
 USA PEL 500

**1779-25-5 Diisobutylaluminum, 25% w/w in hexane (100,0%)**

REL (USA) 2 mg/m<sup>3</sup>  
 as Al

TLV (USA) 1\* mg/m<sup>3</sup>  
 as Al; \*as respirable fraction

**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.

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.

Impervious gloves

Not determined

Tightly sealed safety glasses.

Full face protection

Protective work clothing.

**Breathing equipment:****Protection of hands:****Material of gloves****Penetration time of glove material****Eye protection:****Body protection:****SECTION 9: Physical and chemical properties****9.1 Information on basic physical and chemical properties****General Information****Appearance:**

Form: Solution

Colour: Colourless

Smell: Not determined

Odour threshold: Not determined.

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

Melting point/Melting range: Not determined

Boiling point/Boiling range: Not determined

Sublimation temperature / start: Not determined

**Flash point:** Not applicable**Inflammability (solid, gaseous)** Not determined.**Ignition temperature:** Not determined.**Decomposition temperature:** Not determined.**Self-inflammability:** Not determined.**Critical values for explosion:****Lower:** Not determined**Upper:** Not determined**Steam pressure:** Not determined**Density at 20 °C** 0,72 g/cm<sup>3</sup>**Relative density** Not determined.**Vapour density** Not determined.**Evaporation rate** Not determined.**Solubility in / Miscibility with****Water:** Reacts violently**Partition coefficient (n-octanol/water):** Not determined.**Viscosity:****dynamic:** Not determined.**kinematic:** Not determined.**9.2 Other information** No further relevant information available.**SECTION 10: Stability and reactivity****10.1 Reactivity**

Reacts violently with water.

**10.2 Chemical stability**

Stable under recommended storage conditions.

**Thermal decomposition / conditions to be avoided:**

No decomposition if used and stored according to specifications.

**10.3 Possibility of hazardous reactions**

Contact with acids releases flammable gases

Reacts violently with water

Oxidizing agents

Air

**10.5 Incompatible materials:**(Contd. on page 4)  
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**10.6 Hazardous decomposition products:**

Halocarbons  
Alcohols  
Water/moisture  
Hydrogen chloride (HCl)  
Carbon monoxide and carbon dioxide  
Metal oxide  
Inflammable gases/vapours

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

Swallowing will lead to a strong caustic 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 effect 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:**

Suspected of damaging fertility or the unborn child.

**Specific target organ system toxicity - repeated exposure:**

May cause damage to the peripheral nervous system, the lung, the kidneys, the liver, the reproductive system and the brain through prolonged or repeated exposure. Route of exposure: Inhalative.

**Specific target organ system toxicity - single exposure:**

May cause drowsiness or dizziness.

**Aspiration hazard:**

May be fatal if swallowed and enters airways.

**Additional toxicological information:**

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

**SECTION 12: Ecological information****12.1 Toxicity****Aquatic toxicity:**

No further relevant information available.

**12.2 Persistence and degradability**

No further relevant information available.

**12.3 Bioaccumulative potential**

No further relevant information available.

**12.4 Mobility in soil**

No further relevant information available.

**Ecotoxicological effects:****Remark:**

Toxic for fish

**Additional ecological information:****General notes:**

Do not allow material to be released to the environment without proper governmental permits.  
Toxic for aquatic organisms  
Water danger class 3 (Self-assessment): extremely hazardous for water.  
Do not allow product to reach ground water, water bodies or sewage system, even in small quantities.  
Danger to drinking water if even extremely small quantities leak into soil.  
Also poisonous for fish and plankton in water bodies.  
Toxic to aquatic life.  
May cause long lasting harmful effects to aquatic life.  
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 (diisobutylaluminum/hexane)  
ORGANOMETALLIC SUBSTANCE, LIQUID, WATER-REACTIVE,  
FLAMMABLE (diisobutylaluminum/hexane)

**IMDG, IATA****14.3 Transport hazard class(es)****ADR****Class****Label****IMDG, IATA****Class****Label**

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

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

**Packing group****ADR, IMDG, IATA**

I

**14.5 Environmental hazards:**

Environmentally hazardous substance, liquid

**14.6 Special precautions for user****Kemler Number:**

Warning: Substances which, in contact with water, emit flammable gases.  
X323

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

Not applicable.

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**Transport/Additional information:**

<b>ADR</b>	E0
<b>Excepted quantities (EQ):</b>	0
<b>Limited quantities (LQ)</b>	0
<b>Transport category</b>	B/E
<b>Tunnel restriction code</b>	
<b>UN "Model Regulation":</b>	UN3399, ORGANOMETALLIC SUBSTANCE, LIQUID, WATER-REACTIVE, FLAMMABLE (diisobutylaluminum/hexane), 4.3 (3), I

**SECTION 15: Regulatory information****15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture****Australian Inventory of Chemical**

Substance is listed.

**Substances****Standard for the Uniform Scheduling of**

Substance is not listed.

**Drugs and Poisons****National regulations****Information about limitation of use:**

Employment restrictions concerning young persons must be observed.  
Employment restrictions concerning women of child-bearing age must be observed.  
For use only by technically qualified individuals.

**Water hazard class:**

Water danger class 3 (Self-assessment): extremely hazardous for water.

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

Substance is not listed.

**Substances)****Substances of very high concern (SVHC)**

Substance is not listed.

**according to REACH, Article 57****REACH - Pre-registered substances**

Substance is listed.

**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.

**Department issuing data specification sheet:**

Health, Safety and Environmental Department.

**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-TI: Technical 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  
IATA: International Air Transport Association  
GHS: Globally Harmonized System of Classification and Labelling of Chemicals  
CAS: Chemical Abstracts Service (division of the American Chemical Society)  
LC50: Lethal concentration, 50 percent  
LD50: Lethal dose, 50 percent

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