Safety data sheet

According to Regulation (EC) No. 1907/2006

TMAL

1. IDENTIFICATION OF THE SUBSTANCE OR PREPARATION AND THE COMPANY/UNDERTAKING

Product Identifier Trimethylaluminum, neat
Supplier Akzo Nobel Polymer Chemicals B.V. Stationsstraat 77 PO Box 247 NL-3800 AE Amersfoort The Netherlands T +31 334676767 www.akzonobel.com/polymer
E-mail address of person responsible for safety data sheet RegulatoryPC@akzonobel.com
Emergency telephone AkzoNobel Chemicals-Deventer-NL T +31 570 679211 F +31 570 679801
Relevant identified uses of the substance or mixture co-catalyst for olefin polymerization
Date of last issue / Revision number 2011/05/11 / 1.03
Chemical family Metal alkyl

2. HAZARDS IDENTIFICATION

Reacts violently with water. Spontaneously flammable in air. Causes burns.

GHS classification	
Description	**Applicable**
Pyrophoric liquid	category 1
Water contact emits flammable gases	category 1
Eye irritation	category 1
Skin corrosion/ irritation	category 1B

Pictogram(s) (GHS)

Signal word/Hazard statement(s) GHS	
Code	**Description**

Signal word: DANGER	
H250.	Catches fire spontaneously if exposed to air.
H260.	In contact with water releases flammable gases which may ignite spontaneously.
H26EUH014.	Reacts violently with water.
H314.	Causes severe skin burns and eye damage.

Precautionary statement(s) (GHS)	
Code	**Description**
The precautionary statements marked with a * are mentioned on the label of the packaging of the product.	
P210.	Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P222.	Do not allow contact with air.
P223.	Keep away from any possible contact with water, because of violent reaction and possible flash fire.
P231+P232.	Handle under inert gas. Protect from moisture.
P280d. *)	Wear protective gloves, eye/face protection and protective clothing. *)
P301+P330+P331.	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P302+P334.	IF ON SKIN: Immerse in cool water/wrap in wet bandages.
P303+P361+P353.	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
P304+P340.	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
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. *)
P363.	Wash contaminated clothing before reuse.
P378f. *)	Use vermiculite, dry chemical powder or dry sand for extinction. *)
P402+P404.	Store in a dry place. Store in a closed container.
P422b. *)	Store contents under nitrogen. *)
P501a.	Dispose of contents and container according to local regulation.

3. COMPOSITION/INFORMATION ON INGREDIENTS

This product is to be considered as a substance in conformance to EC directives.
Information on hazardous ingredients
Chemical description Trimethylaluminum, neat
Composition / information on ingredients

Number	**% w/w**	**CAS-number**	**Chemical name**
1	100	000075-24-1	Trimethylaluminum

Number	**REACH Registration number**	**EC-number**	**Classification according to 1272/2008 as amended**			**Classification according to 67/548/EEC as amended**
1		200-853-0	Pyrophoric liquid	category 1	H250 H260 H314	C F R14 R17 R34
			Water contact emits flammable gases	category 1		
			Eye irritation	category 1		

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			Skin corrosion/ irritation	category 1B		

Other information
Technical pure substance.

4. FIRST AID MEASURES

Most important symptoms and effects
Causes burns. Causes injury to the cornea and eyelids. Risk of serious damage to eyes.
Irritating to respiratory system, may cause delayed pulmonary oedema.

Description of first aid measures

General
Call a physician immediately.

Inhalation
Remove to fresh air. If not breathing, give artificial respiration. Oxygen may additionally be given, by trained personnel, if it is available. Get medical attention immediately.

Skin
While wearing impervious gloves and air-tight safety goggles, immediately start continuous flushing of all affected areas on the victim with water for at least 15 minutes. If victim is wearing air-tight safety goggles, do not remove them. Remove contaminated clothing and shoes. If clothing is stuck to the skin after flushing with water, do not remove it. Get medical attention immediately. Wash or destroy clothing. Thoroughly clean or destroy contaminated shoes.

Eye
Immediately start continuous flushing of eyes with water for at least 15 minutes. If easy to do, contact lenses should be removed during the flushing, by trained personnel. Hold the eyelids apart during the flushing to ensure rinsing the entire surface of the eye and lids with water. Get medical attention immediately.

Ingestion
DO NOT induce vomiting. Get medical attention immediately by calling a physician or a poison control center. If victim is conscious and alert, give a cupful of water. Never give anything by mouth to an unconscious or convulsing person. If vomiting occurs, the patient should lie on their left side while vomiting to reduce the risk of aspiration.

Indication of any immediate medical attention and special treatment needed
Persons with pre-existing skin, eye, or respiratory disease may be at increased risk from the irritant or allergic properties of this material.

Irrigate burn area with large amounts of water to decontaminate, if not already done. Chemical burns on the skin should then be treated like thermal burns. Skin reactions may take 24-48 hours to develop. If eyes are affected, flush eyes with buffered or plain irrigating solutions for at least 15 minutes, if not already done. If any ulceration or conjunctival injury is present, have an ophthalmologist examine the patient. Application of cool water helps relieve pain and swelling of both the skin and eyes. If swallowed, do not induce vomiting. Give patient plenty of water to drink. Ingestion of this corrosive material may cause severe ulceration, inflammation, and possible perforation of the gastrointestinal tract. Maintain adequate airway. Aspiration during induced emesis can result in severe lung injury. Contact a Poison Control Center for additional treatment information. Treat any additional effects symptomatically.

5. FIRE-FIGHTING MEASURES

Extinguishing media
vermiculite, dry chemical powder, dry sand.

Unsuitable extinguishing media
Never use water !!! See also Section: Other information.
foam
halones

Hazardous decomposition / combustion products
Products of complete combustion are carbon dioxide, water and aluminum oxide. Additionally, products of incomplete combustion may include carbon monoxide, elemental carbon and hydrocarbons (alkanes and alkenes).

Protective equipment
Firefighters must wear fire resistant protective equipment. Wear approved respirator and protective gloves.

Other information
Evacuate all non-essential personnel. Consider to let it burn out completely. Waterspray may only be used by experienced fire fighters. Cool closed containers with water. After a fire, ventilate thoroughly the area and soak with water, clean the walls and metallic surfaces.

Fire and explosion hazard
CAUTION: reignition may occur. Vapours produced by incomplete combustion may form explosive mixtures with air. In case of fire and/or explosion do not breathe fumes.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions
Do not breathe fumes/vapour. Avoid contact with skin and eyes. For personal protection see Section 8.

Environmental precautions
Do not allow to enter drains or water courses.

Methods and material for containment and cleaning up
Stop leakage if possible. Eliminate all sources of ignition, and do not generate flames or sparks. Take precautionary measures against static discharges. Allow controlled hydrolysis. Isolate spill area. After fire has been extinguished or has been allowed to burn out completely, wait CONSIDERABLE TIME (until smoke is no longer observed). After that, carefully wash spill area with a waterspray.

Other information
Ignition will occur. Evacuate personnel to safe area.

7. HANDLING AND STORAGE

Precautions for safe handling
When using do not eat, drink or smoke. Handle in well ventilated areas. Eliminate all sources of ignition, and do not generate flames or sparks. Take precautionary measures against static discharges. Apply earthing when transferring from one container to another. Avoid contact with moisture and water. Keep under nitrogen. Handle only in closed system. During sampling, disconnecting lines or opening connections, an aluminised suit should be worn. Avoid contact with skin and eyes. Avoid Incompatible materials (See Section 10).

Fire and explosion prevention
Spontaneously flammable in air. Do not cut or weld on or near this container even when empty.

Conditions for safe storage
Store in accordance with local/national regulations. Keep away from food, drink and animal feedingstuffs. Keep under dry nitrogen containing less than 10 ppm oxygen. Protect product from moisture and wet air. Keep container tightly closed and in a well-ventilated place.

Other information
Wash hands thoroughly after handling or contact. Keep working clothing separately and do not take them home.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters
Ensure good ventilation and local exhaustion of the working area.

Personal protection

Respiratory
In case of insufficient ventilation wear suitable respiratory equipment (respirator with Filter A/p2).

Hand
impervious gloves.

Eye
Safety glasses and a full face shield. A face shield is preferred over goggles.

Skin and body
aluminised suit and protective boots (For further advice contact manufacturer).

Other information
Emergency-shower and facilities for rinsing eyes must be accessible. Launder clothes before reuse.

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Trimethylaluminum		
SUVA Limit Values: Time Weighted Average	2 mg/m³	

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance liquid
Colour colourless clear
Boiling point/range 127℃ / 261℉
Melting point/freezing point 15℃ / 59℉
Flash point not applicable
Flammability Extremely flammable. Contact with water liberates extremely flammable gases.
Explosive properties no
Oxidising properties no
Vapour pressure 1.52 kPa (20℃ / 68℉)
Density 743 kg/m³ (30℃ / 86℉) Specific gravity = 0.743 (30℃ / 86℉)
Bulk density not applicable
Solubility in water Reacts violently with water.
Solubility in other solvents Miscible with saturated aliphatic and aromatic hydrocarbons.
pH value not applicable
Partition coefficient n-octanol/water not applicable
Relative vapour density (air=1) not determined
Viscosity 0.9 mPa.s (30℃ / 86℉)
Non-Pyrophoric Limit Non-Pyrophoric Limit : 11% in n-hexane Non-Pyrophoric Limit : 14% in Heptane Non-Pyrophoric Limit : 12% in Toluene
Autoignition temperature Spontaneously flammable in air.
Upper/lower flammability or explosive limits not applicable
Volatile % not determined

10. STABILITY AND REACTIVITY

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Conditions to avoid
In order to prevent thermal decomposition do not overheat (T> 120℃ / 248℉ exothermic).

Chemical stability
Stable under recommended storage and handling conditions (see section 7).

Incompatible materials
Avoid contact with moisture and water, alcohols, acids, organic halides and oxygen containing compounds.

Possibility of hazardous reactions
Polymerization does not occur.

Hazardous decomposition products
Products of complete combustion are carbon dioxide, water and aluminum oxide. Additionally, products of incomplete combustion may include carbon monoxide, elemental carbon and hydrocarbons (alkanes and alkenes).

11. TOXICOLOGICAL INFORMATION

Trimethylaluminum
Acute toxicity
Oral LD50 No data available
Irritation
Skin Corrosive
Eye Corrosive; Risk of serious damage to eyes
Respiratory Corrosive

12. ECOLOGICAL INFORMATION

No experimental ecological data are available on the substance as such.

13. DISPOSAL CONSIDERATIONS

Product
Refer to manufacturer/supplier for information on recovery/recycling. Waste disposal in accordance with regulations (most probably controlled incineration).

Contaminated packaging
According to local regulations. Emptied container might retain product residues. Follow all warnings even after the container is emptied.

Other information
For further advice contact manufacturer.

14. TRANSPORT INFORMATION

Land transport

Transport hazard class
4.2

Classification Code
SW

RID class
4.2

Packing group
I

Hazard Identification No.
X333

According to Regulation (EC) No. 1907/2006

TMAL

Substance Identification No. 3394
UN number 3394
Proper Shipping Name ORGANOMETALLIC SUBSTANCE, LIQUID, PYROPHORIC, WATER-REACTIVE (Trimethylaluminum)
Tunnel code B/E
Required labels 4.2 + 4.3
Subsidiary risk 4.3

Sea transport (IMO / IMDG-code)
Transport hazard class 4.2
Packing group I
UN number 3394
EMS F-G, S-M
Marine pollutant no
Proper Shipping Name ORGANOMETALLIC SUBSTANCE, LIQUID, PYROPHORIC, WATER-REACTIVE (Trimethylaluminum)
Other information Label(s) : 4.2 + 4.3

Air transport (ICAO-TI / IATA-DGR)
UN number Forbidden

15. REGULATORY INFORMATION

Product label name Trimethylaluminum, neat
Labelling according to EC directives
EC-number See section 3
Classification based on The mandatory EU labelling has been followed.

R(isk) phrase(s) (EU classification)	
Code	**Description**
R14.	Reacts violently with water.
R17.	Spontaneously flammable in air.

R34.	Causes burns.

S(afety) phrase(s) (EU classification)	
Code	**Description**
S06B.	Keep under nitrogen.
S16.	Keep away from sources of ignition - No smoking.
S24/25.	Avoid contact with skin and eyes.
S36/37/39.	Wear suitable protective clothing, gloves and eye/face protection.
S43B.	In case of fire, use dry chemical powder; never use water.
S45.	In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

Classification according to 67/548/EC as ammended	
	
CORROSIVE (C)	HIGHLY FLAMMABLE (F)

Other information Substance and/or product listed in Directive 96/82/EC.
German Water Hazard Class (WGK) German: Non-hazardous to waters (NWG)

16. OTHER INFORMATION

Relevant hazard statements		
Chemical name	Hazard statement(s) (GHS-classifcation)	
Trimethylaluminum	H250.	Catches fire spontaneously if exposed to air.
	H260.	In contact with water releases flammable gases which may ignite spontaneously.
	H314.	Causes severe skin burns and eye damage.

R-phrase information		
Chemical name	R(isk) phrase(s) (EU classification)	

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Trimethylaluminum	R14	Reacts violently with water
	R17	Spontaneously flammable in air
	R34	Causes burns

History
Date of printing/ pdf file generated 2013/04/26
Revision 1.03
Composed by Regulatory Affairs - Europe. Regulatory Affairs - North America , T +1-312-544-7000
Changes were made in section 2, GHS classification (EU)
This information only concerns the above mentioned product and does not need to be valid if used with other product(s) or in any process. The information is to our best present knowledge correct and complete and is given in good faith but without warranty. It remains the user's own responsibility to make sure that the information is appropriate and complete for his special use of this product.