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Material Safety Data Sheet

Tetramethylammonium Hydroxide, 25% (Aqueous solution)

Issuing Date 28/04/2011

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Revision Number: 5

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name	Tetramethylammonium Hydroxide, 25% (Aqueous solution)
Synonyms	TMAH 25 W
UN-No	1835
Recommended Use	Catalyst, laboratory chemicals, stripping solution, For use in industrial installations only,
Contact Manufacturer	Supplier
<ul style="list-style-type: none">• SACHEM Americas 2311 Pipeline Road Cleburne, Texas 76031 Tel: 817-202-3200 Fax: 817-641-5637• SACHEM Asia Co., Ltd. 5-6-27 Mizuhai Higashi Osaka 578-0921 Japan TEL 81-729-64-4300 FAX 81-729-64-4301• SACHEM No.116 Meiyu Road Wuxi National Hi-Tech Industrial Development Zone P.R.China 214028 Phone: 0086-510-88556461	<ul style="list-style-type: none">• SACHEM Asia Co., Ltd. Sakaisuji Inabata Bldg. 5F 1-15-14 Minamisemba Chuo-ku, Osaka 542-0081 Japan TEL 81-6-6268-0145 FAX 81-6-6268-0181• SACHEM Americas 2311 Pipeline Road Cleburne, Texas 76031 Tel: 817-202-3200 Fax: 817-641-5637• SACHEM Europe BV Van Voordenpark 15 5301 KP Zaltbommel The Netherlands Telephone: 0031-4186-82000 E-mail: reach@sachemeurope.nl
Emergency Telephone Number	<ul style="list-style-type: none">• CHEMTREC: 1-800-424-9300 for US/ 703-527-3887 outside US• 1-512-421-4900 from 8 a.m. - 5 p.m. Central Time or 1-817-202-3200• Higashi Osaka Japan 81-729-64-4300• SACHEM Europe 0031-6537-70227• SACHEM Wuxi China 0086-532-83889090

2. HAZARDS IDENTIFICATION

DANGER!**Emergency Overview**

Strong bases

May be fatal if inhaled, absorbed through skin, or swallowed
 Destruction of skin tissue as a result of more than 3 minutes exposure
 Avoid contact with skin, eyes and clothing
 Avoid release to the environment

Appearance Colorless, Light yellow.**Physical State of a Mixture** liquid.**Odor** Slight, Amines.**OSHA Regulatory Status**

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Potential Health Effects**Principle Routes of Exposure**

Eye contact, Skin contact, Inhalation.

Acute Effects**Eyes**

Corrosive. Causes severe caustic burns to skin and eyes. Large exposures may be fatal.

Skin.

Corrosive. Causes burns. May be fatal if absorbed through skin.

Inhalation

Corrosive. Causes severe burns. May be fatal if inhaled.

Ingestion

Corrosive. Can burn mouth, throat, and stomach. May be fatal if swallowed.

Chronic Effects**Chronic Toxicity**

Repeated contact may cause allergic reactions in very susceptible persons.

See Section 11 for additional Toxicological information.

Main Symptoms

Liquid, aerosols and vapors of this product are irritating and can cause pain, tearing, reddening and swelling accompanied by a stinging sensation and/or a feeling like that of fine dust in the eyes. Breathing difficulties. If coughing, difficult breathing or other symptoms of poisoning occur, even after several hours, call a physician immediately. Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting. May cause irregular heartbeats, especially under conditions of stress. blurred vision.

Aggravated Medical Conditions

No information available.

Interactions with Other Chemicals

No information available..

Potential Environmental Effects

Harmful to aquatic organisms..

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Family Quaternary ammonium compound

Formula C4H12N.HO

Component	CAS-No	Weight %
Water	7732-18-5	75
Tetramethylammonium Hydroxide	75-59-2	25

4. FIRST AID MEASURES

General advice Do not get in eyes, on skin, or on clothing
Take off contaminated clothing and shoes immediately
In the case of accident or if you feel unwell, seek medical advice immediately (show the label where possible)
Show this safety data sheet to the doctor in attendance

Eye contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Call a physician immediately.

Skin contact Wash off immediately with plenty of water for at least 15 minutes. IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. Remove and wash contaminated clothing before re-use. Call a physician immediately.

Inhalation Immediate medical attention is required. Move to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Consult a physician.

Ingestion Immediate medical attention is required. Never give anything by mouth to an unconscious person. Rinse mouth with water. Drink 1 or 2 glasses of water. Do not induce vomiting without medical advice. Call a physician or Poison Control Centre immediately.

Notes to physician Treat symptomatically. May cause respiratory arrest.

Protection of First-aiders Avoid contact with skin, eyes and clothing.

5. FIRE-FIGHTING MEASURES

Flammable Properties	The product is not flammable. Heating can release vapors which can be ignited.
Suitable Extinguishing Media	Use: Water spray, Carbon dioxide (CO ₂), Foam, Dry chemical,
Hazardous Combustion Products	Carbon monoxide, Nitrogen oxides (NO _x).
<u>Explosion Data</u>	
Specific Hazards Arising from the Chemical	
Causes severe burns. Hazardous combustion products. Carbon monoxide. Nitrogen oxides (NO _x). May be fatal if inhaled, absorbed through skin, or swallowed.	
Protective Equipment and Precautions for Firefighters	
In the event of fire and/or explosion do not breathe fumes. In the event of fire, wear self contained breathing apparatus. Wear personal protective equipment. Avoid contact with skin, eyes and clothing.	
<u>Recommended NFPA</u>	Health 4 Flammability 1 Instability 0

6. ACCIDENTAL RELEASE MEASURES

Personal precautions	P233 - Keep container tightly closed. Do not breathe vapors or spray mist. Do not ingest. Do not get in eyes, on skin, or on clothing. Wear personal protective equipment.
Environmental precautions	Prevent further leakage or spillage if safe to do so. Prevent product from entering drains. Local authorities should be advised if significant spillages cannot be contained. Do not flush into surface water or sanitary sewer system.
Methods for containment	Contain and collect spillage with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).
Methods for Clean-up	Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Prevent product from entering drains. Keep in suitable and closed containers for disposal.

7. HANDLING AND STORAGE

Handling	<p>Wear personal protective equipment Remove and wash contaminated clothing before re-use Do not breathe vapours or spray mist In case of insufficient ventilation, wear suitable respiratory equipment Do not ingest Do not eat, drink or smoke when using this product Ensure that eyewash stations and safety showers are close to the workstation location Do not get in eyes, on skin, or on clothing</p>
Storage	<p>Keep container tightly closed Keep away from heat Store in accordance with local regulations To avoid thermal decomposition, do not overheat Polyethylene containers stainless steel</p>

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Measures	<p>Ensure adequate ventilation, especially in confined areas Exhaust ventilation equipped with scrubbers Skin and body protection Avoid formation of aerosol Do not breathe vapours or spray mist</p>
<u>Personal Protective Equipment</u>	
Eye/face Protection	<p>Do not get in eyes, on skin, or on clothing. Tightly fitting safety goggles. Face-shield. Causes severe caustic burns to skin and eyes.</p>
Skin Protection	<p>Wear protective gloves/clothing. Chemical resistant apron. Impervious clothing. Nitrile rubber. Neoprene gloves. Long sleeve gloves. Destruction of skin tissue as a result of more than 3 minutes exposure.</p>
Hand Protection	<p>Long sleeve gloves. Nitrile rubber. Neoprene gloves.</p>
Respiratory protection	<p>In case of mist, spray or aerosol exposure wear suitable personal respiratory protection and protective suit. In case of insufficient ventilation wear suitable respiratory equipment.</p>
Other Protective Equipment	<p>Ensure that eyewash stations and safety showers are close to the workstation location.</p>
General Hygiene Considerations	<p>Do not eat, drink or smoke when using this product. Remove and wash contaminated clothing before re-use. Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and immediately after handling the product.</p>

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Colorless. Light yellow.	
Odor	Slight Amines	
Odor Threshold	No information available.	
Physical State of a Mixture	liquid	
pH	>13	
Flash Point	>95 °C;	
Autoignition Temperature	No data available	
Freezing Point	-25 °C;	
Boiling point/boiling range	Ca. 102 °C;	
Melting Point/Range	No data available	
Flammability Limits in Air	upper No data available	Lower No data available
Explosive properties	No information available.	
Oxidizing Properties	None known	
Vapor Pressure @20°C (kPa)	16.0 mm Hg @ 25 C	
Vapor Density	No information available.	
Specific Gravity	1.014 @ 20 C	
Bulk Density	No data available	
Water Solubility	Miscible with water	
Partition coefficient:	-2.47	
Viscosity, dynamic	3.13 centipoise @ 19 C	
Molecular Weight	91.15	

10. STABILITY AND REACTIVITY

Chemical Stability	Stable under normal conditions. Hazardous polymerisation does not occur.
Conditions to Avoid	Temperatures above 100°C. Heating can release hazardous gases. To avoid thermal decomposition, do not overheat.
Incompatible Materials	Strong oxidizing agents. Strong acids. PVDF.
Hazardous Decomposition Products	Amines. Methanol.
Hazardous Reactions	None under normal processing

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Product Information May be fatal if inhaled, absorbed through skin, or swallowed
 Causes severe caustic burns to skin and eyes

Component Information

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Water	-	-	-
Tetramethylammonium Hydroxide	34-50 mg/kg rat	112 mg/kg (rat) 25 mg/kg (guinea pig) for 50% (reported in RTECS)	No information available.

Chronic Toxicity

Carcinogenicity There are no known carcinogenic chemicals in this product..

Legend:

ACGIH: (American Conference of Governmental Industrial Hygienists)

IARC: (International Agency for Research on Cancer)

NTP: (National Toxicity Program)

OSHA: (Occupational Safety & Health Administration)

RTECS: (Registry of Toxic Effects of Chemical Substances)

Other Toxicity Information: Additional information may be found in RTECS.
RTECS No: PA0875000

Corrosivity. Causes severe burns.

Mutagenic Effects Not mutagenic in AMES Test.

Target Organ Effects Skin, Eyes, Respiratory system, Heart, Nervous system.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Acute aquatic toxicity testing has shown this compound to be highly toxic to the ceriodaphnia dubia (water flea).

Ecotoxicity Effects

Harmful to aquatic organisms..

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea
Water	-	-	-	-
Tetramethylammonium Hydroxide	Pseudokirchneriella subcatitata: 72h = 96 mg/l	LC50 Pimephales promelas/96h = 462 mg/l (TMAC)	No information available.	Daphnia magna EC50/48h = 13.9 mg/l Ceriodaphnia dubia LC50/48h = 1.3-1.5 mg/l Ceriodaphnia dubia LC50/96h = 0.4 mg/l

Persistence and Degradability

Expected to be biodegradable.

Bioaccumulation

Not likely to bioaccumulate.

Mobility

Will likely be mobile in the environment due to its water solubility

Water

Log Pow No data available

Tetramethylammonium Hydroxide

Log Pow 0.9

13. DISPOSAL CONSIDERATIONS

Waste Disposal Methods

Can be incinerated, when in compliance with local regulations. Can be disposed as waste water, when in compliance with local regulations. Dispose of contents/container in accordance with local regulation. Neutralization is normally necessary before waste water is discharged into water treatment plants.

Contaminated packaging

Triple rinse containers. Treat rinsing as for product disposal.

Waste from Residues / Unused Products

Dispose of in accordance with local regulations. Can be incinerated, when in compliance with local regulations. Neutralization is normally necessary before waste water is discharged into water treatment plants. Solutions with high pH-value must be neutralized before discharge.

US EPA Waste Number

D002

Would be considered as a characteristic hazardous waste under RCRA if disposed in the form as shipped from SACHEM

14. TRANSPORT INFORMATION**DOT**

Proper shipping name	UN1835-Tetramethylammonium hydroxide solution,
UN-No	1835
Hazard class	8
Packing Group	PGII
Description	UN1835, Tetramethylammonium hydroxide solution, 8, PGII

IATA

IATA Proper Shipping Name	1835 - Tetramethylammonium hydroxide solution
UN-No	1835
Hazard class	8
Packing Group	PGII
Description	UN1835, Tetramethylammonium hydroxide solution, 8, PGII

IMDG/IMO

IMDG/IMO Proper Shipping Name	1835 - Tetramethylammonium hydroxide solution
UN-No	1835
Hazard class	8
Packing Group	PGII
Description	UN1835, Tetramethylammonium hydroxide solution, 8, PGII

15. REGULATORY INFORMATION

USA**Federal Regulations****SARA 313**

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

Component	CAS-No	Weight %	SARA 313 - Threshold Values
Water	7732-18-5	75	-
Tetramethylammonium Hydroxide	75-59-2	25	-

SARA 311/312 Hazardous Categorization

Chronic Health Hazard	No
Acute Health Hazard	Yes
Fire Hazard	No
Sudden Release of Pressure Hazard	No
Reactive Hazard	No

Clean Water Act

Component	CAS-No	Weight %	HAPS data	VOC Chemicals	Class 1 Ozone Depletors	Class 2 Ozone Depletors
Water	7732-18-5	75	-	-	-	-
Tetramethylammonium Hydroxide	75-59-2	25	-	-	-	-

CERCLA

not applicable

Listed on the New Jersey Right to Know Hazardous Substances List.

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Tetramethylammonium Hydroxide		Listed			

International Regulations**International Inventories**

Component	ENCS	PICCS	DSL	TSCA	CHINA	AICS	KECL	NDSL	EINECS	ELINCS	EC-No
Water	X	X	X	X	X	X	X	-	231-791-2	-	231-791-2

Tetramethylammonium Hydroxide	2-186	X	X	X	X	X	KE-3355 0	-	200-882- 9	-	200-882-9
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TSCA

- All components of this product are listed on the TSCA Chemical Inventory.

16. OTHER INFORMATION

Health Hazard	3
Fire Hazard	0
Reactivity	1



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Revision Note

(M)SDS sections updated; 2; 3; 12; 16;

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text. In case of any questions, please refer to the official document in English and contact us in your region.

End of Safety Data Sheet