

TMAH (Tetramethylammonium Hydroxide)

Date of Preparation: February, 2001

Revision: 2

Section 1 - Chemical Product and Company Identification**Product/Chemical Name:** Tetramethylammonium Hydroxide**Synonyms:** TMAH, TMAH Developer**Chemical Formula:** (CH₃)₄NOH**Non-Emergency Contact:** Kanto Corporation, 13424 N. Woodrush Way, Portland, OR 97203
Customer Service, Phone (503) 283-0405, FAX (503) 240-0409**For All Transportation Emergencies Call CHEMTREC at 1800-424-9300****Section 2 - Composition / Information on Ingredients**

Ingredient Name	CAS Number	% by wt.
Tetramethylammonium Hydroxide	75-59-2	2 - 25
RO/DI Water	N/A	75 - 98

Occupational Exposure Limits

OSHA PEL	ACGIH TLV	NIOSH REL
None Established	None Established	None Established

Section 3 - Hazards Identification**☆☆☆☆☆ Emergency Overview ☆☆☆☆☆**

Danger! Corrosive alkaline solution. Causes burns to any area of contact. Harmful if swallowed, inhaled or absorbed through the skin.

HMIS**H** 3**F** 0**R** 0**PPE**†

†Sec. 8

Potential Health Effects**Primary Entry Routes:** Inhalation, ingestion, skin, and eye contact**Target Organs:** Eyes, skin, respiratory system, mucous membranes, liver and kidneys.**Acute Effects****Inhalation:** Vapors may be irritating to nose, throat and respiratory system and may cause irritation, cough, and difficulty breathing. May produce upper airway edema, pulmonary edema, and pneumonitis.**Eye:** Eye exposures produce severe irritation with effects similar to those of dilute caustics. Inflammation or burns with possible damage to the eye tissues can occur together with tearing and considerable pain. Is potentially fatal following eye exposure.**Skin:** Dermal contact may produce pain, redness, severe irritation or full thickness burns. May be absorbed through the skin with possible systemic effects.**Ingestion:** Solution, if swallowed, is harmful to mouth, throat, esophagus and digestive tract. May produce burns to the lips, tongue, mucous membranes, upper airway, esophagus and occasionally stomach.**Carcinogenicity:** IARC, NTP, ACGIH and OSHA do not list carcinogen.**Chronic Effects:** Chronic exposure may affect kidneys and liver.**Medical Conditions Aggravated by Long Term Exposure:** Persons with pre-existing skin disorders or eye problems or impaired liver or kidney function may be more susceptible to the effects of chemical.**Section 4 - First Aid Measures****Inhalation:** Remove at once to uncontaminated atmosphere and seek medical attention. For severe exposure, use oxygen if a qualified operator is available and if breathing is difficult. If not breathing, give artificial respiration.**Eye Contact:** Do not allow victim to rub or keep eyes tightly shut. Lift eyelids and flush eyes immediately and continuously with flooding amounts of water until transported to medical facility. Iced-water compresses may be applied to eyes while awaiting medical attention. Consult an ophthalmologist immediately.**Skin Contact:** Immediately flush affected areas with large amounts of water for at least 15 minutes while removing contaminated clothing and shoes. Get prompt medical attention.**Ingestion:** Never give anything by mouth to an unconscious or convulsing person. **Do not induce vomiting.** Give large quantities of water. Seek medical attention immediately.*After first aid, get appropriate in-plant, paramedic, or community medical support.*

Section 5 - Fire-Fighting Measures

Flash Point: None

Flash Point Method: N/A

Autoignition Temperature: N/A

LEL: N/A

UEL: N/A



Extinguishing Media: TMAH is noncombustible, use extinguishing media appropriate to surrounding fire.

Unusual Fire or Explosion Hazards: Not considered to be a fire or explosion hazard.

Hazardous Combustion Products: Toxic gases produced include amines, oxides of nitrogen, carbon monoxide, and carbon dioxide.

Fire-Fighting Instructions: Water stream may splash chemical onto personnel. Use water spray to keep fire exposed containers cool. Do not release runoff from fire control methods to sewers or waterways.

Fire-Fighting Equipment: Because fire may produce toxic thermal decomposition products, wear a self-contained breathing apparatus (SCBA) with a full facepiece operated in pressure-demand or positive-pressure mode.

Section 6 - Accidental Release Measures

Small Spills: Notify appropriate personnel, isolate area and deny entry. Fully protected personnel should flush spill with plenty of water, taking care not to splash personnel. Small spills can be picked up with vermiculite or other absorbent, noncombustible material.

Large Spills: Notify appropriate personnel and implement facility emergency response plan. Evacuate nonessential personnel, isolate area, provide maximum ventilation. Cleanup personnel should wear fully protective equipment for vapor inhalation and skin and eye contact.

Containment: For large spills, dike far ahead of liquid spill for later disposal. Do not release directly into sewers or waterways.

Cleanup: Place clean-up material in appropriate disposal containers and dispose of according to local, state and federal requirements.

Regulatory Requirements: Any release to the environment of this product may be subject to federal and/or state reporting requirements. Check with appropriate agencies.

Section 7 - Handling and Storage

Handling Precautions: Workers handling this chemical should be thoroughly trained in safety procedures and undergo periodic medical surveillance. Avoid inhaling vapor or mist. Avoid all contact with eyes or skin. Keep from contact with clothing and other combustible materials. Use only with adequate ventilation. Wash thoroughly after handling. Educate workers in hazards and first aid treatment for exposures.

Storage Requirements: Store at temperatures between 50-90 °F and in a well ventilated, properly drained/contained site, away from heat, out of the sun, and away from combustibles and reactive chemicals. Use only approved containers, and protect containers from damage and keep material from freezing.

Regulatory Requirements: Store in accordance with locally adopted building codes and OSHA requirements.

Section 8 - Exposure Controls / Personal Protection

Engineering Controls

Ventilation: A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Refer to the ACGIH document, *Industrial Ventilation, A Manual or Recommended Practices*, for details.

Administrative/PPE Controls

Respiratory Protection: For conditions of use where exposure to TMAH is apparent, seek professional advice prior to respirator selection and use. Select respirator based on its suitability to provide adequate worker protection for given working conditions. For emergency or non-routine operations (cleaning spills, reactor vessels, or storage tanks), wear an SCBA. If respirators are used, OSHA requires a written respiratory protection program that includes at least: medical certification, training, fit testing, periodic environmental monitoring, maintenance, inspection, cleaning, and convenient, sanitary storage areas.

Protective Clothing/Equipment: Wear chemically protective gloves, boots, aprons, and gauntlets to prevent prolonged or repeated skin contact. Wear chemically protective suit when potentially exposed to chemical under pressure, or awkward positions where aprons do not cover exposed areas. Wear protective face shield with chemical safety goggles. Contact lenses are not eye protective devices and should not be worn with potential chemical splash exposures. Appropriate eye protection must be worn instead of contact lenses when potentially exposed to chemical splashes.

Safety Stations: Make emergency eyewash stations, safety/quick-drench showers, and washing facilities available in work area.

Contaminated Equipment: Separate contaminated work clothes from street clothes. Launder before reuse. Remove this material from your shoes and clean personal protective equipment.

Comments: Never eat, drink, or smoke in work areas. Practice good personal hygiene after using this material, especially before eating, drinking, smoking, using the toilet, or applying cosmetics.

Section 9 - Physical and Chemical Properties

Physical State: Liquid	Water Solubility: Complete
Appearance and Odor: Colorless liquid with strong amine odor	Boiling Point: 100°C (212°F)
Vapor Pressure: Approx. 18 mm Hg at 20°C (68°F)	Freezing/Melting Point: N/A
Vapor Density (Air=1): 0.6	Specific Gravity (H₂O=1, at 4 °C): Approximately 1.02
	pH: 13.4 (2 %) – 14.7 (20%)

Section 10 - Stability and Reactivity

Stability: TMAH is stable at room temperature in closed containers under normal storage and handling conditions.
Polymerization: Hazardous polymerization cannot occur.
Chemical Incompatibilities: Strong Acids, acid chlorides, acid anhydrides, oxidizing agents, reducing agents, alkali metals.
Conditions to Avoid: Increasing temperature (causes more rapid evolution of gases), heat, flames, and incompatibles.
Hazardous Decomposition Products: Ammonia, volatile amines, nitrogen oxides, and alcohols.

Section 11- Toxicological Information

Acute Inhalation Effects: LC ₅₀ Dose: Not Available Acute Oral Effects: LD ₅₀ Dose: Not Available Carcinogenicity: Components not listed or classified (IARC, NIOSH, NTP, OSHA, EPA, ACGIH).	Epidemiology: No data available Teratogenicity: No data available Reproductive Effects: No data available Neurotoxicity: No data available Mutagenicity: No data available
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Section 12 - Ecological Information

Ecotoxicity:
No information found

Environmental Effect: No specific information available. Chemical is potentially harmful to aquatic life. May be dangerous if it enters water intakes. Notify local health and wildlife officials, and operators of nearby water intakes. Prevent entry into waterways, sewers, basements or confined areas.

Section 13 - Disposal Considerations

Disposal: Contact a licensed contractor for detailed disposal recommendations. Follow applicable Federal, state, and local regulations.
Disposal Regulatory Requirements: Not listed as a RCRA hazardous waste, but characteristic due to corrosivity (waste code D002) as packaged. Dispose of in accordance with local, state and federal requirements for solid waste. Confirm regulatory disposal requirements based on actual use.
Container Cleaning and Disposal: Empty contents (in accordance with applicable regulations) and triple rinse container prior to recycle or disposal.

Section 14 - Transport Information

DOT Transportation Data (49 CFR 172.101):

Shipping Name: Tetramethylammonium Hydroxide	Packaging Authorizations Exceptions: 173.154 Non-bulk Packaging: 173.202 Bulk Packaging: 173.242	Quantity Limitations Passenger, Aircraft, or Railcar: 1 liter Cargo Aircraft Only: 30 liters
Hazard Class: 8 UN ID No.: 1835 Packing Group: II Label: 8 Special Provisions: B2, T8		Vessel Stowage Requirements Vessel Stowage: A
		Emergency Response Guidebook #153

Section 15 - Regulatory Information**EPA Regulations:**

RCRA Hazardous Waste Classification: D002. (Characteristic of Corrosivity)

CERCLA Hazardous Substance (40 CFR 302.4): Not Listed

TSCA Inventory List: Listed

SARA Title III:

Section 302 – Not listed (RQ/TPQ)

SARA Codes: Acute

SARA 313 – Not reportable

OSHA Regulations:

Air Contaminant (29 CFR 1910.1000, Table Z-1, Z-1-A): Not listed.

This product is considered as a hazardous material under criteria of 29 CFR 1910.1200

Section 16 - Other Information

Revision Notes: Rev0 (3/1999) - New MSDS

Rev1 (2/2001) - Reviewed for accuracy (no changes)

Rev2 (4/2006) - Reviewed for accuracy (no changes)

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