

Revised February 23, 2004
Supersedes March 22, 2002 revision

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: TMAC

SYNONYMS: N,N,N – Trimethyl Methanaminium Chloride
USAF AN-8
Tetramethylammonium Chloride

MANUFACTURER: BCP Ingredients, Inc.
299 Extension Street
Verona, MO 65769-0085
(417) 498-2241 [USA]

EMERGENCY CONTACT: (417) 498-2241 [USA] – Facility
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2. COMPOSITION/INFORMATION ON INGREDIENTS

<u>COMPONENTS</u>	<u>WEIGHT %</u>	<u>CAS #</u>	<u>EXPOSURE LIMITS</u>	<u>CITATION</u>
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H ₂ O	40 - 69			
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HAZARDOUS

<u>COMPONENTS</u>	<u>WEIGHT %</u>	<u>CAS #</u>	<u>EXPOSURE LIMITS</u>	<u>CITATION</u>
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(CH ₃) ₄ NCl	31 - 60	75-57-0	Not Established	
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3. HAZARDS IDENTIFICATION

Emergency Overview

Clear liquid; odorless to slight amine (fish-like) odor. Irritating to eyes, respiratory tract and skin. When heated to decomposition, releases very toxic fumes of nitrogen oxides (NO_x) and chlorides (Cl). Poison by intraperitoneal, subcutaneous and other unspecified routes.

Potential Health Effects

Eye: May cause eye irritation or chemical burn.

Inhalation: Breathing vapors may cause respiratory irritation.

Skin: May cause skin irritation.

Ingestion: May be fatal if swallowed. It may cause rapid removal of calcium from the body. May chelate lead in the gastrointestinal tract causing absorption.

Systemic: No known physiological hazards.

Medical Conditions Aggravated by Exposure: None determined.

Exposure Symptoms:

Acute –	Eye: Burning, itching or pain Inhalation: Nose and throat irritation, coughing, dizziness, headache, drowsiness. Skin: Mild (redness) to severe (blisters) irritation depending on extent of contact. Ingestion: Irritation of the mouth, throat and stomach including nausea, vomiting, diarrhea, and abdominal pain. May cause numbness and tingling sensations; urinary frequency, chills, fever and arthralgia
Chronic –	Eye: May cause conjunctivitis Inhalation: None determined Skin: May cause dermatitis Ingestion: High doses of pure salt have induced severe renal tubular lesions in man and animal

4. FIRST AID MEASURES

Eye: Flush immediately with clean, low-pressure water for at least 15 minutes while occasionally lifting eyelids. Notify supervisor and seek medical attention.

Inhalation: No emergency care anticipated. If there is difficulty breathing, remove to fresh air and get medical attention.

Skin: Wash immediately with soap and water. Remove contaminated clothing and wash contacted skin with soap and water. If irritation occurs or persists, check with medical personnel. Wash contaminated clothing before reuse.

Ingestion: Seek medical attention immediately. If victim is conscious, give up to two quarts of water and induce vomiting. Do not give anything by mouth if the victim is drowsy, unconscious, or has no gag reflex.

Note to Physician: If medical attention is sought, treatment should be based on the judgement of the physician in response to the reactions of the patient.

5. FIRE FIGHTING MEASURES

Flammable Properties: Flash point – >200°F.; Method – closed cup

Flammable Limits: Lower Flammable Limit (LFL) – not determined
Upper Flammable Limit (UFL) – not determined

Auto Ignition Temperature: Not determined

Hazardous Combustion Products: No specific hazards. Combustion will produce compounds of carbon, hydrogen, nitrogen and oxygen. Hydrogen chloride could also potentially be produced. The exact composition of the products of combustion will depend on the conditions of combustion.

Other Fire and Explosion Hazards: None.

Extinguishing Media: Water, Foam, CO₂, Dry Chemical.

Fire Fighting Equipment: Full protective equipment (Bunker Gear) and NIOSH/MSHA approved SCBA should be used for all fires.

Fire Fighting Instructions: This material may burn, but it does not readily ignite. Use water spray to cool sealed drums surrounded by a fire to prevent bursting from steam pressure. Material is incompatible with strong oxidizers. Water run off can cause environmental damage. Dike and collect water used to fight fires.

6. ACCIDENTAL RELEASE MEASURES

Use absorbent materials to contain and collect spilled material. Place used absorbent in a disposal container.

7. HANDLING AND STORAGE

General Handling Precautions

Avoid contact with eyes, skin and clothing. Wash thoroughly after handling. Avoid breathing vapors. Ensure containers are properly secured before moving.

Storage Information

Storage temperature: Ambient recommended. Do not allow to freeze.

Shelf life: No known limit. Use within 1 year recommended.

Special Sensitivity: None

Miscellaneous: Material is incompatible with strong oxidizers.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls: None. Local and general exhaust recommended.

Eye Protection: Use safety glasses with side shields, chemical safety goggles and/or face shield. The choice of protection should be appropriate to the task being performed and risk of splashing.

Respiratory Protection: For most conditions, no respiratory protection should be needed. An organic vapor/acid gas cartridge with a dust/mist filter may be used if desired. In confined or poorly ventilated areas or emergency conditions, use an approved positive pressure self-contained breathing apparatus.

Skin Protection: Adequate skin protection should be provided at all times to minimize skin contact. Use rubber gloves, rubber aprons, splash suits, and/or sleeve protectors. The choice of protection should be appropriate to the task being performed and risk of splashing.

9. PHYSICAL AND CHEMICAL PROPERTIES

Chemical Family:	Quaternary salt
Appearance:	Clear
Physical state:	Liquid
Odor:	Odorless to slight amine odor

Molecular Formula:	C ₄ H ₁₂ NCI
Molecular Weight:	109.62
Specific Gravity:	1.0153
Bulk Density:	8.50 pounds/gallon
Solubility:	Soluble
Octanol/Water Partition Coefficient: Not determined (assumed to be 0)	
pH:	7 (typical)
Melting Point:	Not determined
Boiling Point:	216°F. (102°C.) at 760 mmHg
Decomposition Point:	788°F (420°C) for pure salt
Evaporation Rate:	Not determined.
VOC Content:	45 – 50% volatile by volume including water.
Vapor Pressure:	25 mmHg
Vapor Density:	<1
Viscosity:	6 cps

10. STABILITY AND REACTIVITY

Chemical Stability:	Stable under normal conditions.
Material Incompatibility:	Incompatible with strong oxidizers.
Hazardous Decomposition Products:	Compounds of carbon, hydrogen, nitrogen and oxygen. Potentially could produce hydrogen chloride gas.
Hazardous Polymerization:	None

11. TOXICOLOGICAL INFORMATION

Mysidopsis bahia: 96-hour, 10.5 ppm
LD₅₀ = 220 mg/kg (for male rats)

Pure salt

LD_{LO} = 125mg/kg oral (mouse)
LD₅₀ = 25mg/kg intraperitoneal (mouse)
LD₅₀ = 40mg/kg subcutaneous (mouse)
LD_{LO} = 20mg/kg (mouse)
LD_{LO} = 6mg/kg subcutaneous (rabbit)
LD_{LO} = 20mg/kg (guinea pig)
LD_{LO} = 2gm/kg subcutaneous (frog)

12.ECOLOGICAL INFORMATION

Biodegrades slowly.

LC₅₀ = 462,000 mg/L pure salt for fathead minnow (*Pimephales promelas*)

13.DISPOSAL CONSIDERATIONS

Not considered a hazardous waste under Federal Hazardous Waste Regulations (40 CFR 261). Liquid solutions should be solidified or absorbed, and should be landfilled after securing Environmental Regulatory Agency and landfill operations approval. Containers should be emptied completely and have all closures in place. Return containers for reuse, or dispose in a landfill after securing Environmental Regulatory Agency and landfill operations approval. Consult state and local regulations regarding proper disposal as they may be more restrictive or otherwise different from Federal regulations.

14.TRANSPORT INFORMATION

D.O.T. Hazardous Material (49 CFR 172.101).

Shipping Description: Toxic liquid, organic, n.o.s., 6.1, UN2810, PGIII (contains tetramethylammonium chloride).

Labeling: Poison

Emergency Response Guide Number: 153

15.REGULATORY INFORMATION

U.S. Federal Regulations

OSHA: This product is hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29 CFR 1910.1200.

PSM: This product is not subject to Process Safety Management (29 CFR 1910.119).

FIFRA: Not applicable.

TSCA: On TSCA inventory.

CERCLA: Reportable Quantity – None (40 CFR 302.4).

SARA TITLE III: Section 302 Extremely Hazardous Substances – None (40 CFR 355).
Section 311/312 Hazard Categories – Immediate chronic mixture (40 CFR 370.2)
Section 313 Toxic Chemicals – None (40 CFR 372.65)

RMP: Not listed under the Risk Management Plan (40 CFR 68).

RCRA: If discarded in purchased form, this product is not a listed or characteristic hazardous waste. However, under RCRA, it is the responsibility of the product user to determine at the time of disposal whether a material containing the product or derived from the product should be classified as a hazardous waste (40 CFR 261.20-24).

CWA: Release into a waterway may require reporting to the National Response Center @ 800-424-8802 (40 CFR 116.4).

FDA/USDA: Follow Good Manufacturing Practice (GMP).

International Regulations

Canadian Dangerous Substance List (DSL): Not available.

European Inventory of Existing Commercial Chemical Substances (EINECS): Not available.

Australian Inventory of Chemical Substances (AICS): Not available.

Korean Existing Chemicals List (ECL): Not available.

State Regulations

California Proposition 65: Not listed.

There are no known additional requirements necessary for compliance with state right-to-know regulations.

16. OTHER INFORMATION

Reason for Issue: Revision to Section 1, Manufacturer's name changed.

Hazard Ratings - The following hazard ratings are recommended for this product:

NFPA	
Fire	- 1
Health	- 3
Reactivity	- 0
Specific Hazard	- None

(NFPA Scale: 4 = severe, 3 = serious, 2 = moderate, 1 = slight, 0 = minimal)

Abbreviations - The following abbreviations are used in this document:

% - percent

cps - centipoises

gm/kg - grams per kilogram

mg/kg - milligrams per kilogram

mmHg - milligrams per cubic meter

mg/m³ - milligrams per cubic meter

n.o.s. - not otherwise specified

ppm - parts per million

µg/L - micrograms per liter

ACGIH - American Council of Governmental Industrial Hygienists

AICS - Australian Inventory of Chemical Substances

CAS - Chemical Abstract Service

CERCLA - Comprehensive Emergency Response, Compensation and Liability Act

CFR - Code of Federal Regulations

CWA - Clean Water Act

D.O.T. - Department of Transportation

DSL - Domestic Substance List (Canada)

ECL - Existing Chemicals List (Korea)

EINECS - European Inventory of Existing Commercial Substances

FDA - Food and Drug Administration

FIFRA - Federal Insecticide, Fungicide and Rodenticide Act

IDLH - Immediately Dangerous to Life and Health

LC₅₀ - Lethal concentration fifty; a calculated concentration of a substance in air, exposure to which for a specified length of time is expected to cause death of 50% of a laboratory animal population.

LD_{LO} - Lethal dose low; the lowest dose of a substance introduced by any route other than inhalation reported to have caused death in humans or animals.

LD₅₀ – Lethal dose fifty; the dose of a substance expected to cause 50% mortality of an experimental animal population.

LFL - Lower Flammable Limit

MSHA - Mine Safety Health Administration

NFPA - National Fire Protection Association

NIOSH - National Institute of Occupational Safety and Health

OSHA - Occupational Safety and Health Administration

PEL - Permissible Exposure Limit (default 8-hour day, 40-hour week TWA)

PSM - Process Safety Management

RCRA - Resource Conservation and Recovery Act

REL - Recommended Exposure Limit (default 10-hour day, 40-hour week TWA)

RMP - Risk Management Plan

SARA - Superfund Amendment and Reauthorization Act

STEL - Short Term Exposure Limit (default 15-minute TWA)

TSCA - Toxic Substance Control Act

TWA - Time Weighted Average

UFL - Upper Flammable Limit

USDA - United States Department of Agriculture

This information is furnished without warranty, expressed or implied, regarding this information, the results to be obtained from the use thereof, or the hazards connected with the use of this material, except that it is accurate to the best knowledge of BCP Ingredients, Inc.. The data on this MSDS relate only to the specific material designated herein. Final determination of the suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, since the product may be subjected to conditions beyond our control and with which we may be unfamiliar, we cannot guarantee that these are the only hazards which exist. Nor can we assume any responsibility for the results of the use of this data. It is expected that the persons receiving this data shall make their own determination of the effects, properties, and protections which pertain to their particular situation.

Prepared by: EH&S Department (417) 498-2241 [USA]

Toxic liquids, organic, n.o.s. (contains tetramethylammonium chloride)

GUIDE
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SUBSTANCES - TOXIC AND/OR CORROSIVE
(COMBUSTIBLE)

ERG2008

ERG2008

SUBSTANCES - TOXIC AND/OR CORROSIVE
(COMBUSTIBLE)

GUIDE
153

POTENTIAL HAZARDS

HEALTH

- **TOXIC:** inhalation, ingestion or skin contact with material may cause severe injury or death.
- Contact with molten substance may cause severe burns to skin and eyes.
- Avoid any skin contact.
- Effects of contact or inhalation may be delayed.
- Fire may produce irritating, corrosive and/or toxic gases.
- Runoff from fire control or dilution water may be corrosive and/or toxic and cause pollution.

FIRE OR EXPLOSION

- **COMBUSTIBLE material:** may burn but does not ignite readily.
- When heated, vapors may form explosive mixtures with air: indoors, outdoors and sewers explosion hazards.
- Those substances designated with a "P" may polymerize explosively when heated or involved in a fire.
- Contact with metals may evolve flammable hydrogen gas.
- Containers may explode when heated.
- Runoff may pollute waterways.
- Substance may be transported in a molten form.

PUBLIC SAFETY

- **CALL Emergency Response Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- As an immediate precautionary measure, isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.
- Keep unauthorized personnel away.
- Stay upwind. • Keep out of low areas. • Ventilate enclosed areas.

PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.

EVACUATION

Spill

- See Table 1 - Initial Isolation and Protective Action Distances for highlighted materials. For non-highlighted materials, increase, in the downwind direction, as necessary, the isolation distance shown under "PUBLIC SAFETY".

Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.

EMERGENCY RESPONSE

FIRE

Small Fire

- Dry chemical, CO₂ or water spray.

Large Fire

- Dry chemical, CO₂, alcohol-resistant foam or water spray.
- Move containers from fire area if you can do it without risk.
- Dike fire-control water for later disposal; do not scatter the material.
- **Fire Involving Tanks or Car/Trailer Loads**

- Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
- Do not get water inside containers.
- Cool containers with flooding quantities of water until well after fire is out.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from tanks engulfed in fire.

SPILL OR LEAK

- **ELIMINATE** all ignition sources (no smoking, flares, sparks or flames in immediate area).
- Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
- Stop leak if you can do it without risk.
- Prevent entry into waterways, sewers, basements or confined areas.
- Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.
- **DO NOT GET WATER INSIDE CONTAINERS.**

FIRST AID

- Move victim to fresh air. • Call 911 or emergency medical service.
- Give artificial respiration if victim is not breathing.
- **Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.**
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- For minor skin contact, avoid spreading material on unaffected skin.
- Keep victim warm and quiet.
- Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.