# TITANIUM TETRAKIS(DIMETHYLAMIDE), 99+% Safety Data Sheet

## SECTION 1: Identification of the substance/mixture and of the company/undertaking

### 1.1. Product identifier

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product form</td>
<td>Substance</td>
</tr>
<tr>
<td>Physical state</td>
<td>Liquid</td>
</tr>
<tr>
<td>Substance name</td>
<td>TITANIUM TETRAKIS(DIMETHYLAMIDE), 99+%</td>
</tr>
<tr>
<td>Product code</td>
<td>OMTI080</td>
</tr>
<tr>
<td>Formula</td>
<td>C₈H₂₄N₄Ti</td>
</tr>
<tr>
<td>Synonyms</td>
<td>TDMAT; TETRAKIS(DIMETHYLAMIDO)TITANIUM; TETRAKISDIMETHYLAMINOTITANIUM</td>
</tr>
<tr>
<td>Chemical family</td>
<td>METAL COMPOUND</td>
</tr>
</tbody>
</table>

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

Use of the substance/mixture: Chemical intermediate
For research and industrial use only

### 1.3. Details of the supplier of the safety data sheet

**GELEST, INC.**
11 East Steel Road
Morrisville, PA 19067
USA
T 215-547-1015 - F 215-547-2484 - (M-F): 8:00 AM - 5:30 PM EST
info@gelest.com - www.gelest.com

### 1.4. Emergency telephone number

Emergency number: CHEMTREC: 1-800-424-9300 (USA); +1 703-527-3887 (International)

## SECTION 2: Hazards identification

### 2.1. Classification of the substance or mixture

**GHS-US classification**
- Flam. Liq. 2 H225
- Skin Corr. 1B H314
- Eye Dam. 1 H318
- STOT SE 3 H335

**Full text of H statements:** see section 16

### 2.2. Label elements

**GHS-US labeling**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>GHS02</td>
<td>Danger</td>
<td>H225 - Highly flammable liquid and vapor</td>
<td></td>
</tr>
<tr>
<td>GHS05</td>
<td></td>
<td>H314 - Causes severe skin burns and eye damage</td>
<td></td>
</tr>
<tr>
<td>GHS07</td>
<td></td>
<td>H318 - Causes serious eye damage</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>H335 - May cause respiratory irritation</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>P210 - Keep away from heat, open flames, sparks. - No smoking</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>P210 - Keep container tightly closed</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>P240 - Ground/bond container and receiving equipment</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>P241 - Use explosion-proof electrical equipment</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>P242 - Use only non-sparking tools</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>P243 - Take precautionary measures against static discharge</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>P260 - Do not breathe vapors</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>P264 - Wash hands thoroughly after handling</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>P271 - Use only outdoors or in a well-ventilated area</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>P301+P330+P331 - If swallowed: rinse mouth. Do NOT induce vomiting</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>P303+P361+P353 - If on skin (or hair): take off immediately all contaminated clothing, rinse skin with water/shower</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>P304+P340 - If inhaled: Remove person to fresh air and keep comfortable for breathing</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing</td>
<td></td>
</tr>
</tbody>
</table>
TITANIUM TETRAKIS(DIMETHYLAMIDE), 99+%  
Safety Data Sheet  
03/18/2016  
EN (English US)  
SDS ID: OMT0100  

2.3. Other hazards  
Other hazards not contributing to the classification: Additional dimethylamine may be formed by reaction with moisture and water. The US OSHA PEL (TWA) for dimethylamine is 10 ppm.

2.4. Unknown acute toxicity (GHS US)  
No data available

SECTION 3: Composition/Information on ingredients  
3.1. Substance  
Name: TITANIUM TETRAKIS(DIMETHYLAMIDE), 99+%  
CAS No: 3275-24-9  
EC no: 221-904-3

<table>
<thead>
<tr>
<th>Name</th>
<th>Product identifier</th>
<th>%</th>
<th>GHS-US classification</th>
</tr>
</thead>
</table>
| Titanium tetrakis(dimethylammonium) | (CAS No) 3275-24-9 | 99 | Flam. Liq. 2, H225  
| | | 100 | Skin Corr. 1B, H314 
| | | | Eye Dam. 1, H318  
| | | | STOT SE 3, H335 |

3.2. Mixture  
Not applicable

SECTION 4: First aid measures  
4.1. Description of first aid measures  
First-aid measures general: Remove contaminated clothing and shoes. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). If possible show this sheet; if not available show packaging or label.

First-aid measures after inhalation: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical advice/attention.

First-aid measures after skin contact: Wash with plenty of soap and water. Get immediate medical advice/attention.

First-aid measures after eye contact: Immediately flush eyes thoroughly with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get immediate medical advice/attention.

First-aid measures after ingestion: Never give anything by mouth to an unconscious person. Get medical advice/attention.

4.2. Most important symptoms and effects, both acute and delayed  
Symptoms/injuries: Causes severe skin burns and eye damage.

Symptoms/injuries after inhalation: May cause respiratory irritation.

Symptoms/injuries after skin contact: Causes (severe) skin burns.

Symptoms/injuries after eye contact: Causes serious eye damage.

Symptoms/injuries after ingestion: May be harmful if swallowed.

4.3. Indication of any immediate medical attention and special treatment needed  
No additional information available

SECTION 5: Firefighting measures  
5.1. Extinguishing media  

Unsuitable extinguishing media: Do not use straight streams.

5.2. Special hazards arising from the substance or mixture  
Fire hazard: Highly flammable liquid and vapor. Irritating fumes of ethylmethylamine and organic acid vapors may develop when material is exposed to water or open flame.

Explosion hazard: May form flammable/explosive vapor-air mixture.

5.3. Advice for firefighters  
Firefighting instructions: Exercise caution when fighting any chemical fire. Use water spray to cool exposed surfaces.

Protection during firefighting: Do not enter fire area without proper protective equipment, including respiratory protection. Avoid all eye and skin contact and do not breathe vapor and mist.
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SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures: Eliminate every possible source of ignition. Use special care to avoid static electric charges.

6.1.1. For non-emergency personnel

Protective equipment: Wear protective equipment as described in Section 8.
Emergency procedures: Evacuate unnecessary personnel.

6.1.2. For emergency responders

Protective equipment: Do not attempt to take action without suitable protective equipment. Equip cleanup crew with proper protection. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

6.3. Methods and material for containment and cleaning up

For containment: Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.
Methods for cleaning up: Clean up any spills as soon as possible, using an absorbent material to collect it. Sweep or shovel spills into appropriate container for disposal. Use only non-sparking tools.

6.4. Reference to other sections

See Heading 8. Exposure controls and personal protection.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Additional hazards when processed: Handle empty containers with care because residual vapors are flammable. Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
Precautions for safe handling: Avoid all eye and skin contact and do not breathe vapor and mist. Ground/bond container and receiving equipment. Take precautionary measures against static discharge. Use only outdoors or in a well-ventilated area. Use only non-sparking tools.
Hygiene measures: Wash contaminated clothing before reuse. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures: Proper grounding procedures to avoid static electricity should be followed. Use explosion-proof electrical equipment.
Storage conditions: Keep container tightly closed. Keep in a cool place. Store locked up.
Storage area: Store in a well-ventilated place. Store away from heat.

7.3. Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

No additional information available

8.2. Exposure controls

Appropriate engineering controls: Provide local exhaust or general room ventilation.
Personal protective equipment: Avoid all unnecessary exposure. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.

Hand protection: Neoprene or nitrile rubber gloves.
Eye protection: Chemical goggles or face shield. Contact lenses should not be worn.
Skin and body protection: Wear suitable protective clothing.
Respiratory protection: Where exposure through inhalation may occur from use, respiratory protection equipment is recommended. NIOSH-certified combination organic vapor - amine gas (brown cartridge) respirator.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state: Liquid
Appearance: Liquid.
Molecular mass: 224.2 g/mol
Color: Orange-amber.

03/18/2016 EN (English US) SDS ID: OMT080 3/7
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<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Odor</td>
<td>Acrid. Amine. fishy.</td>
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<tr>
<td>Odor threshold</td>
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<tr>
<td>Refractive index</td>
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<tr>
<td>pH</td>
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<tr>
<td>Relative evaporation rate (butyl acetate=1)</td>
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<tr>
<td>Melting point</td>
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<tr>
<td>Freezing point</td>
<td>&lt; 0 °C</td>
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<tr>
<td>Boiling point</td>
<td>50 °C @ 0.05 mm Hg</td>
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<tr>
<td>Flash point</td>
<td>8 °C</td>
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<tr>
<td>Auto-ignition temperature</td>
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<tr>
<td>Decomposition temperature</td>
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<tr>
<td>Flammability (solid, gas)</td>
<td>Highly flammable liquid and vapor</td>
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<tr>
<td>Vapor pressure</td>
<td>0.1 mm Hg @ 25°C</td>
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<tr>
<td>Relative vapor density at 20 °C</td>
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</tr>
<tr>
<td>Relative density</td>
<td>0.947</td>
</tr>
<tr>
<td>Solubility</td>
<td>Reacts with water.</td>
</tr>
<tr>
<td>Log Pow</td>
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</tr>
<tr>
<td>Log Kow</td>
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<tr>
<td>Viscosity, kinematic</td>
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</tr>
<tr>
<td>Viscosity, dynamic</td>
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<tr>
<td>Explosive properties</td>
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</tr>
<tr>
<td>Oxidizing properties</td>
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</tr>
<tr>
<td>Explosion limits</td>
<td>No data available</td>
</tr>
</tbody>
</table>

9.2. Other information
No additional information available

SECTION 10: Stability and reactivity
10.1. Reactivity
No additional information available

10.2. Chemical stability
Stable in sealed containers stored under a dry inert atmosphere.

10.3. Possibility of hazardous reactions
Reacts with water and moisture in air, liberating dimethylamine.

10.4. Conditions to avoid
Heat. Open flame. Sparks.

10.5. Incompatible materials

10.6. Hazardous decomposition products

SECTION 11: Toxicological information
11.1. Information on toxicological effects
Acute toxicity : Not classified
Skin corrosion/irritation : Causes severe skin burns and eye damage.
Serious eye damage/irritation : Causes serious eye damage.
Respiratory or skin sensitization : Not classified
Germ cell mutagenicity : Not classified
Carcinogenicity : Not classified
Reproductive toxicity : Not classified
Specific target organ toxicity (single exposure) : May cause respiratory irritation.
Specific target organ toxicity (repeated exposure) : Not classified
Aspiration hazard : Not classified
Symptoms/injuries after inhalation : May cause respiratory irritation.
Symptoms/injuries after skin contact : Causes (severe) skin burns.
TITANIUM TETRAKIS(DIMETHYLAMIDE), 99+%
Safety Data Sheet

<table>
<thead>
<tr>
<th>Symptoms/injuries after eye contact</th>
<th>Causes serious eye damage.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symptoms/injuries after ingestion</td>
<td>May be harmful if swallowed.</td>
</tr>
<tr>
<td>Reason for classification</td>
<td>Expert judgment</td>
</tr>
</tbody>
</table>

**SECTION 12: Ecological information**

12.1. **Toxicity**
No additional information available

12.2. **Persistence and degradability**
No additional information available

12.3. **Bioaccumulative potential**
No additional information available

12.4. **Mobility in soil**
No additional information available

12.5. **Other adverse effects**
Other adverse effects: This substance may be hazardous to the environment.
Effect on ozone layer: No additional information available
Effect on the global warming: No known ecological damage caused by this product.

**SECTION 13: Disposal considerations**

13.1. **Waste treatment methods**
Sewage disposal recommendations: Do not dispose of waste into sewer.
Waste disposal recommendations: Dispose in a safe manner in accordance with local/national regulations. Dispose of contents/container to licensed waste disposal facility.
Additional information: Handle empty containers with care because residual vapors are flammable.
Ecology - waste materials: Avoid release to the environment.

**SECTION 14: Transport information**

14.1. **UN number**
UN-No.(DOT): 2924
DOT NA no.: UN2924

14.2. **UN proper shipping name**
Proper Shipping Name (DOT): Flammable liquids, corrosive, n.o.s.
(TITANIUM TETRAKIS(DIMETHYLAMIDE))
Class (DOT): 3 - Class 3 - Flammable and combustible liquid 49 CFR 173.120
Hazard labels (DOT): 3 - Flammable liquid
8 - Corrosive

DOT Symbols: G - Identifies PSN requiring a technical name
Packing group (DOT): II - Medium Danger
DOT Packaging Exceptions (49 CFR 173.xxx): 150
DOT Packaging Non Bulk (49 CFR 173.xxx): 202
DOT Packaging Bulk (49 CFR 173.xxx): 243

14.3. **Additional information**
Emergency Response Guide (ERG) Number: 132
Other information: No supplementary information available.

**Transport by sea**

DOT Vessel Stowage Location: B - (i) The material may be stowed “on deck” or “under deck” on a cargo vessel and on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers, or one passenger per each 3 m of overall vessel length; and (ii) “On deck only” on passenger vessels in which the number of passengers specified in paragraph (k)(2)(i) of this section is exceeded

DOT Vessel Stowage Other: 40 - Stow “clear of living quarters”
Air transport
DOT Quantity Limitations Passenger aircraft/rail : 1 L (49 CFR 173.27)
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75)

SECTION 15: Regulatory information

15.1. US Federal regulations
Titanium tetrakis(dimethylammonium) (3275-24-9)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

15.2. International regulations
Titanium tetrakis(dimethylammonium) (3275-24-9)
Listed on the Canadian NDSL (Non-Domestic Substances List)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

15.3. US State regulations

<table>
<thead>
<tr>
<th>TITANIUM TETRAKIS(DIMETHYLAMIDE), 99+% (3275-24-9)</th>
<th>U.S. - California - Proposition 65 - Carcinogens List</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. - California - Proposition 65 - Developmental Toxicity</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>U.S. - California - Proposition 65 - Reproductive Toxicity - Female</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>U.S. - California - Proposition 65 - Reproductive Toxicity - Male</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Titanium tetrakis(dimethylammonium) (3275-24-9)</th>
<th>U.S. - California - Proposition 65 - Carcinogens List</th>
<th>U.S. - California - Proposition 65 - Developmental Toxicity</th>
<th>U.S. - California - Proposition 65 - Reproductive Toxicity - Female</th>
<th>U.S. - California - Proposition 65 - Reproductive Toxicity - Male</th>
<th>Non-significant risk level (NSRL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

SECTION 16: Other information

Abbreviations and acronyms:
- ND: Not Determined
- NA: Not Applicable
- LD: Lethal Dose
- LC: Lethal Concentration
- ATE: Acute Toxicity Estimates
- H: hour
- °C: °C unless otherwise stated
- mm: millimeters Hg, torr
- PEL: permissible exposure level
- TWA: time weighted average
- TLV: threshold limit value
- TG: Test Guideline
- NIOSH: National Institute for Occupational Safety and Health
- IARC: International Agency for Research on Cancer
- NTP: National Toxicology Program
- HMIS: Hazardous Material Information System
- CAS No.: Chemical Abstract Service Registration Number
- EC No.: European Commission Registration Number
- EC Index No.: European Commission Index Number

Full text of H-phrases:

<table>
<thead>
<tr>
<th>H225</th>
<th>Highly flammable liquid and vapor</th>
</tr>
</thead>
<tbody>
<tr>
<td>H314</td>
<td>Causes severe skin burns and eye damage</td>
</tr>
<tr>
<td>H318</td>
<td>Causes serious eye damage</td>
</tr>
<tr>
<td>H335</td>
<td>May cause respiratory irritation</td>
</tr>
</tbody>
</table>

HMIS III Rating
- Health: 4 Severe Hazard - Life-threatening, major or permanent damage may result from single or repeated overexposures
- Flammability: 3 Serious Hazard
- Physical: 1 Slight Hazard

Prepared by safety and environmental affairs.
Date of issue: 03/18/2016
Version: 1.0

SDS US (GHS HazCom 2012) - Custom
TITANIUM TETRAKIS(DIMETHYLAMIDE), 99+%
Safety Data Sheet

According to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

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