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

1.1. Product identifier

Product form: Substance
Physical state: Solid
Substance name: ZIRCONIUM TETRAKIS(DIMETHYLAMIDE)
Product code: OMZR080
Formula: C8H24N4Zr
Synonyms: TDMAZ; TETRAKIS(DIMETHYLAMIDO)ZIRCONIUM
Chemical family: METAL COMPOUND

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

1.2.1. Relevant identified uses
Use of the substance/mixture: Chemical intermediate

1.2.2. Uses advised against
No additional information available

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

GELEST INC.
Fritz-Klatte-Strasse 8
65933 Frankfurt
Germany
T +49 (0) 69 3535106-500 - F +49 (0) 69 3535106-501 - (M-F): 8:00 AM - 4:00 PM
info@gelestde.com - www.gelestde.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

Classification according to Regulation (EC) No. 1272/2008 [CLP]
- Skin corrosion/irritation, Category 1C: H314
- Serious eye damage/eye irritation, Category 1: H318
- Specific target organ toxicity — Single exposure, Category 3: H335
- Respiratory tract irritation

Adverse physicochemical, human health and environmental effects
No additional information available

2.2. Label elements

Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Signal word (CLP): Danger
Hazard pictograms (CLP):

GHS05

GHS07

Hazard statements (CLP):
H314 - Causes severe skin burns and eye damage.
H335 - May cause respiratory irritation.

2.3. Other hazards
No additional information available

SECTION 3: Composition/information on ingredients

3.1. Substances

<table>
<thead>
<tr>
<th>Substance type</th>
<th>Mono-constituent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>ZIRCONIUM TETRAKIS(DIMETHYLAMIDE)</td>
</tr>
<tr>
<td>CAS-No.</td>
<td>19756-04-8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name</th>
<th>Product identifier</th>
<th>%</th>
<th>Classification according to Regulation (EC) No. 1272/2008 [CLP]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zirconium tetrakis(dimethylamide)</td>
<td>(CAS-No.) 19756-04-8</td>
<td>&gt; 95</td>
<td>Skin Corr. 1C, H314 Eye Dam. 1, H318 STOT SE 3, H335</td>
</tr>
</tbody>
</table>

Full text of H-statements: see section 16

3.2. Mixtures
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 person to fresh air and keep comfortable for breathing. Get medical advice/attention.

First-aid measures after skin contact: Wash with plenty of 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/effects: Causes severe skin burns and eye damage.


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

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

Symptoms/effects 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: None known.

5.2. Special hazards arising from the substance or mixture

Fire hazard: Irritating fumes of dimethylamine and organic acid vapors may develop when material is exposed to water or open flame.

5.3. Advice for firefighters

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

Protection during firefighting: Do not enter fire area without proper protective equipment, including respiratory protection. Avoid contact with skin and eyes. Do not breathe dust.
SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel
Emergency procedures: Evacuate unnecessary personnel.

6.1.2. For emergency responders
Protective equipment: Equip cleanup crew with proper 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
Methods for cleaning up: Sweep or shovel spills into appropriate container for disposal.

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
Precautions for safe handling: Avoid contact with skin and eyes. Do not breathe dust. Provide local exhaust or general room ventilation to minimize exposure to dust.

Hygiene measures: Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Wash contaminated clothing before reuse.

7.2. Conditions for safe storage, including any incompatibilities
Storage conditions: Keep container tightly closed.


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
Zirconium tetrakis(dimethylamide) (19756-04-8)

USA OSHA OSHA PEL (TWA) (ppm) 10 ppm (Dimethylamine)

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:
NIOSH-certified dust and mist (orange cartridge) respirator.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties
Physical state: Solid
Appearance: Solid.
Molecular mass: 267.53 g/mol
Colour: Pale yellow.
ZIRCONIUM TETRAKIS(DIMETHYLAMIDE)
Safety Data Sheet

Odour threshold : No data available
Refractive index : No additional information available
pH : No data available
Relative evaporation rate (butylacetate=1) : No data available
Melting point : 64 °C
Freezing point : No data available
Boiling point : 80 °C @ 0.1 mm Hg
Flash point : > 65 °C
Auto-ignition temperature : No data available
Decomposition temperature : No data available
Flammability (solid, gas) : No data available
Vapour pressure : < 0.1 mm Hg @ 25°C
Relative vapour density at 20 °C : > 1
Relative density : > 1
Solubility : Reacts with water.
Log Pow : No data available
Log Kow : No data available
Viscosity, kinematic : No data available
Viscosity, dynamic : No data available
Explosive properties : No data available
Oxidising properties : No data available
Explosive limits : No data available

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
Acids. alcohols. Moisture. Oxidizing agent. Water :

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 sensitisation : Not classified
Germ cell mutagenicity : Not classified
Carcinogenicity : Not classified
Reproductive toxicity : Not classified
STOT-single exposure : May cause respiratory irritation.
STOT-repeated exposure : Not classified
Aspiration hazard : Not classified
Symptoms/effects after skin contact : Causes (severe) skin burns.
Symptoms/effects after eye contact : Causes serious eye damage.
Symptoms/effects after ingestion : May be harmful if swallowed.
**ZIRCONIUM TETRAKIS(DIMETHYLAMIDE)**

Safety Data Sheet

**Reason for classification** : Expert judgment

### SECTION 12: Ecological information

#### 12.1. Toxicity

- **Acute aquatic toxicity** : Not classified
- **Chronic aquatic toxicity** : Not classified

#### 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. Results of PBT and vPvB assessment

No additional information available

#### 12.6. Other adverse effects

Other adverse effects : This substance may be hazardous to the environment.

### SECTION 13: Disposal considerations

#### 13.1. Waste treatment methods

Product/Packaging disposal recommendations : Dispose in a safe manner in accordance with local/national regulations. Dispose of contents/container to licensed waste disposal facility.

Ecology - waste materials : Avoid release to the environment.

### SECTION 14: Transport information

#### 14.1. UN number

In accordance with ADR / RID / IMDG / IATA / ADN

| UN-No. (ADR) | 1759 |
| UN-No. (IMDG) | 1759 |
| UN-No. (IATA) | 1759 |
| UN-No. (ADN) | 1759 |
| UN-No. (RID) | 1759 |

#### 14.2. UN proper shipping name

| Proper Shipping Name (ADR) | CORROSIVE SOLID, N.O.S. |
| Proper Shipping Name (IMDG) | CORROSIVE SOLID, N.O.S. |
| Proper Shipping Name (IATA) | Corrosive solid, n.o.s. |
| Proper Shipping Name (ADN) | CORROSIVE SOLID, N.O.S. |
| Proper Shipping Name (RID) | CORROSIVE SOLID, N.O.S. |

| Transport document description (ADR) | UN 1759 CORROSIVE SOLID, N.O.S. (ZIRCONIUM TETRAKIS(DIMETHYLAMIDE)), 8, III, (E) |
| Transport document description (IMDG) | UN 1759 CORROSIVE SOLID, N.O.S. (ZIRCONIUM TETRAKIS(DIMETHYLAMIDE)), 8, III |
| Transport document description (IATA) | UN 1759 Corrosive solid, n.o.s. (ZIRCONIUM TETRAKIS(DIMETHYLAMIDE)), 8, III |
| Transport document description (ADN) | UN 1759 CORROSIVE SOLID, N.O.S. (ZIRCONIUM TETRAKIS(DIMETHYLAMIDE)), 8, III |
| Transport document description (RID) | UN 1759 CORROSIVE SOLID, N.O.S. (ZIRCONIUM TETRAKIS(DIMETHYLAMIDE)), 8, III |

#### 14.3. Transport hazard class(es)

**ADR**

- **Transport hazard class(es) (ADR)** : 8
- **Danger labels (ADR)** : 8

**IMDG**

- **Transport hazard class(es) (IMDG)** : 8
## ZIRCONIUM TETRAKIS(DIMETHYLAMIDE)

Safety Data Sheet

### 14.4. Packing group

<table>
<thead>
<tr>
<th>Packing group (ADR)</th>
<th>III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Packing group (IMDG)</td>
<td>III</td>
</tr>
<tr>
<td>Packing group (IATA)</td>
<td>III</td>
</tr>
<tr>
<td>Packing group (ADN)</td>
<td>III</td>
</tr>
<tr>
<td>Packing group (RID)</td>
<td>III</td>
</tr>
</tbody>
</table>

### 14.5. Environmental hazards

| Dangerous for the environment | No |
| Marine pollutant | No |
| Other information | No supplementary information available |

### 14.6. Special precautions for user

- **Overland transport**
  | Classification code (ADR) | C10 |
  | Special provisions (ADR) | 274 |
  | Limited quantities (ADR) | 5kg |
  | Excepted quantities (ADR) | E1 |
  | Packing instructions (ADR) | P002, IBC08, LP02, R001 |
  | Mixed packing provisions (ADR) | MP10 |
  | Portable tank and bulk container instructions (ADR) | T1 |
ZIRCONIUM TETRAKIS(DIMETHYLAMIDE)
Safety Data Sheet

Portable tank and bulk container special provisions (ADR) : TP33
Tank code (ADR) : SGAV, L4BN
Vehicle for tank carriage : AT
Transport category (ADR) : 3
Special provisions for carriage - Bulk (ADR) : VC1, VC2, AP7
Hazard identification number (Kemler No.) : 80
Orange plates : 80

Tunnel restriction code (ADR) : E
EAC code : 2X

- Transport by sea
Special provisions (IMDG) : 223, 274
Limited quantities (IMDG) : 5 kg
Excepted quantities (IMDG) : E1
Packing instructions (IMDG) : P002, LP02
IBC packing instructions (IMDG) : IBC08
IBC special provisions (IMDG) : B3
Tank instructions (IMDG) : T1
Tank special provisions (IMDG) : TP33
EmS-No. (Fire) : F-A
EmS-No. (Spillage) : S-B
Stowage category (IMDG) : A
Properties and observations (IMDG) : Causes burns to skin, eyes and mucous membranes.

- Air transport
PCA Excepted quantities (IATA) : E1
PCA Limited quantities (IATA) : Y845
PCA limited quantity max net quantity (IATA) : 5kg
PCA packing instructions (IATA) : 860
PCA max net quantity (IATA) : 25kg
CAO packing instructions (IATA) : 864
CAO max net quantity (IATA) : 100kg
Special provisions (IATA) : A3
ERG code (IATA) : 8L

- Inland waterway transport
Classification code (ADN) : C10
Special provisions (ADN) : 274
Limited quantities (ADN) : 5 kg
Excepted quantities (ADN) : E1
Equipment required (ADN) : PP, EP
Number of blue cones/lights (ADN) : 0

- Rail transport
Classification code (RID) : C10
Special provisions (RID) : 274
Limited quantities (RID) : 5kg
Excepted quantities (RID) : E1
Packing instructions (RID) : P002, IBC08, LP02, R001
Special packing provisions (RID) : B3
Mixed packing provisions (RID) : MP10
Portable tank and bulk container instructions (RID) : T1
Portable tank and bulk container special provisions (RID) : TP33
Tank codes for RID tanks (RID) : SGAV, L4BN
Transport category (RID) : 3

Print date: 10/04/2019 EN (English) SDS ID: OMZR080
ZIRCONIUM TETRAKIS(DIMETHYLAMIDE)
Safety Data Sheet

Special provisions for carriage – Bulk (RID) : VC1, VC2, AP7
Colis express (express parcels) (RID) : CE11
Hazard identification number (RID) : 80

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code
Not applicable

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

15.1.1. EU-Regulations
No REACH Annex XVII restrictions
ZIRCONIUM TETRAKIS(DIMETHYLAMIDE) is not on the REACH Candidate List
ZIRCONIUM TETRAKIS(DIMETHYLAMIDE) is not on the REACH Annex XIV List
ZIRCONIUM TETRAKIS(DIMETHYLAMIDE) is not subject to REGULATION (EU) No 649/2012 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 4 July 2012 concerning the export and import of hazardous chemicals.

15.1.2. National regulations

Germany
12th Ordinance Implementing the Federal Immission Control Act - 12.BImSchV : Is not subject of the 12. BlmSchV (Hazardous Incident Ordinance)

Netherlands
SZW-lijst van kankerverwekkende stoffen : The substance is not listed
SZW-lijst van mutagene stoffen : The substance is not listed
NIET-lijst van voor de voortplanting giftige stoffen – Borstvoeding : The substance is not listed
NIET-lijst van voor de voortplanting giftige stoffen – Vruchtbaarheid : The substance is not listed

Denmark
Classification remarks : Emergency management guidelines for the storage of flammable liquids must be followed
Danish National Regulations : Young people below the age of 18 years are not allowed to use the product

15.2. Chemical safety assessment
No additional information available

SECTION 16: Other information

Abbreviations and acronyms:
Abbreviations: ND: Not Determined, No Data; NA: Not Applicable; LD: Lethal Dose; LC: Lethal Concentration; ATE: Acute Toxicity Estimates; H: hour; °: °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; OECD: The Organisation for Economic Co-operation and Development; GHS: The Globally Harmonized System of Classification and Labelling; APF: Assigned Protection Factor

Other information : Prepared by safety and environmental affairs.

Full text of H- and EUH-statements:

Eye Dam. 1 : Serious eye damage/eye irritation, Category 1
Skin Corr. 1C : Skin corrosion/irritation, Category 1C
STOT SE 3 : Specific target organ toxicity — Single exposure, Category 3, Respiratory tract irritation
H314 : Causes severe skin burns and eye damage.
H318 : Causes serious eye damage.
H335 : May cause respiratory irritation.