

## • SAFETY DATA SHEET

Version 7.1  
Revision Date 11/06/2025  
Print Date 11/07/2025

### SECTION 1. IDENTIFICATION

#### 1.1 Product identifiers

Product name : Tetrakis(dimethylamido)zirconium(IV)  
Product Number : 579211  
Brand : Aldrich  
CAS-No. : 19756-04-8

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

Identified uses : Laboratory chemicals, Synthesis of substances  
Uses advised against : The product is being supplied under the TSCA R&D Exemption (40 CFR Section 720.36). It is the recipient's responsibility to comply with the requirements of the R&D exemption. The product may not be used for a non-exempt commercial purpose under TSCA unless appropriate consent is granted in writing by MilliporeSigma.

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

Company : Sigma-Aldrich Inc.  
3050 SPRUCE ST  
ST. LOUIS MO 63103  
UNITED STATES  
Telephone : +1 314 771-5765  
Fax : +1 800 325-5052

#### 1.4 Emergency telephone number

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

---

### SECTION 2. HAZARDS IDENTIFICATION

#### GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)

##### Hazards for the product as supplied

Flammable solids : Category 1

|  |                                   |
|--|-----------------------------------|
| Chemicals which, in contact with water, emit flammable gases | : Category 2                      |
| Skin irritation  | : Category 2                      |
| Eye irritation   | : Category 2A                     |
| Specific target organ toxicity - single exposure             | : Category 3 (Respiratory system) |

### **Other hazards**

Reacts violently with water.

### **GHS label elements**

|                   |   |   |
|-------------------|---|---|
| Hazard pictograms | : |   |
|-------------------|---|---|

|             |          |
|-------------|----------|
| Signal word | : Danger |
|-------------|----------|

|                   |  |
|-------------------|--|
| Hazard statements | : H228 Flammable solid.<br>H261 In contact with water releases flammable gases.<br>H315 Causes skin irritation.<br>H319 Causes serious eye irritation.<br>H335 May cause respiratory irritation. |
|-------------------|--|

|                          |   |
|--------------------------|---|
| Precautionary statements | : <b>Prevention:</b><br>P210 Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking.<br>P223 Do not allow contact with water.<br>P231 + P232 Handle under inert gas. Protect from moisture.<br>P240 Ground/bond container and receiving equipment.<br>P241 Use explosion-proof electrical/ ventilating/ lighting equipment.<br>P261 Avoid breathing dust.<br>P264 Wash skin thoroughly after handling.<br>P271 Use only outdoors or in a well-ventilated area.<br>P280 Wear protective gloves/ eye protection/ face protection. |
|--------------------------|---|

### **Response:**

|                                |   |
|--------------------------------|---|
| P302 + P352 IF ON SKIN:        | Wash with plenty of soap and water.   |
| P304 + P340 + P312 IF INHALED: | Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor if you feel unwell. |
| P305 + P351 + P338 IF IN EYES: | Rinse cautiously with water for several minutes. Remove contact lenses, if                                      |

present and easy to do. Continue rinsing.  
P332 + P313 If skin irritation occurs: Get medical advice/ attention.  
P335 + P334 Brush off loose particles from skin. Immerse in cool water/ wrap in wet bandages.  
P337 + P313 If eye irritation persists: Get medical advice/ attention.  
P362 Take off contaminated clothing and wash before reuse.  
P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.

**Storage:**

P402 + P404 Store in a dry place. Store in a closed container.

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.

P405 Store locked up.

**Disposal:**

P501 Dispose of contents/ container to an approved waste disposal plant.

---

### SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Substance

CAS-No. : 19756-04-8

**Components**

| Chemical name                         | CAS No./Unique ID | Concentration (% w/w) | Trade secret |
|---------------------------------------|-------------------|-----------------------|--------------|
| Tetrakis(dimethylamido) zirconium(IV) | 19756-04-8*       | >= 90 - <= 100        | -            |

\* Indicates that the identifier is a CAS No.

Actual concentration is withheld as a trade secret

---

### SECTION 4. FIRST AID MEASURES

General advice : Show this safety data sheet to the doctor in attendance.

If inhaled : After inhalation: fresh air.

In case of skin contact : In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower.

In case of eye contact : After eye contact: rinse out with plenty of water. Call in ophthalmologist.

|   |   |
|---|---|
|   | Remove contact lenses.  |
| If swallowed  | : After swallowing: immediately make victim drink water (two glasses at most). Consult a physician.                   |
| Most important symptoms and effects, both acute and delayed | : The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11 |
| Protection of first-aiders                                  | : For personal protection see section 8.  |
| Notes to physician  | : No data available   |

---

## SECTION 5. FIREFIGHTING MEASURES

|                                       |  |
|---------------------------------------|--|
| Suitable extinguishing media          | : Carbon dioxide (CO <sub>2</sub> )<br>Dry powder  |
| Unsuitable extinguishing media        | : Water<br>Foam  |
| Specific hazards during fire fighting | : Combustible.<br><br>May not get in touch with: Water   |
|                                       | Development of hazardous combustion gases or vapours possible in the event of fire.  |
| Hazardous combustion products         | : Carbon oxides<br><br>Nitrogen oxides (NO <sub>x</sub> )<br><br>Zirconium oxides  |
| Specific extinguishing methods        | : No data available  |
| Further information                   | : Suppress (knock down) gases/vapours/mists with a water spray jet.<br>Prevent fire extinguishing water from contaminating surface water or the ground water system. |

Special protective equipment for fire-fighters : Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

---

## SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures : Advice for non-emergency personnel:  
Avoid inhalation of dusts.  
Avoid substance contact.  
Ensure adequate ventilation.  
Keep away from heat and sources of ignition.  
Evacuate the danger area, observe emergency procedures, consult an expert.  
Advice for emergency responders:  
For personal protection see section 8.

Environmental precautions : Do not let product enter drains.  
Risk of explosion.

Methods and materials for containment and cleaning up : Cover drains. Collect, bind, and pump off spills.  
Observe possible material restrictions (see sections 7 and 10).  
Take up dry. Dispose of properly. Clean up affected area. Avoid generation of dusts.

---

## SECTION 7. HANDLING AND STORAGE

For precautions see section 2.2.

Advice on protection against fire and explosion : Keep away from open flames, hot surfaces and sources of ignition.  
Take precautionary measures against static discharge.

Advice on safe handling : Keep workplace dry. Do not allow product to come into contact with water.

Further information on storage conditions : Tightly closed.  
Keep away from heat and sources of ignition.

Materials to avoid : Never allow product to get in contact with water during storage.

Storage class : 4.3, Hazardous materials, which set free flammable gases upon contact with water

Recommended storage : 36 - 46 °F / 2 - 8 °C

temperature

Further information on storage stability : Handle and store under inert gas.  
Air and moisture sensitive.

Packaging material : Suitable material: Amber Glass Bottle/Jar

---

## SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### Ingredients with workplace control parameters

| Components                           | CAS-No.    | Value type<br>(Form of<br>exposure) | Control<br>parameters /<br>Permissible<br>concentration | Basis     |
|--------------------------------------|------------|-------------------------------------|---|-----------|
| Tetrakis(dimethylamido)zirconium(IV) | 19756-04-8 | TWA                                 | 5 mg/m <sup>3</sup><br>(Zirconium)                      | OSHA Z-1  |
|                                      |            | TWA                                 | 5 mg/m <sup>3</sup><br>(Zirconium)                      | ACGIH     |
|                                      |            | STEL                                | 10 mg/m <sup>3</sup><br>(Zirconium)                     | ACGIH     |
|                                      |            | TWA                                 | 5 mg/m <sup>3</sup><br>(Zirconium)                      | NIOSH REL |
|                                      |            | ST                                  | 10 mg/m <sup>3</sup><br>(Zirconium)                     | NIOSH REL |

**Engineering measures** : No data available

### Personal protective equipment

Respiratory protection : required when dusts are generated.

Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

Recommended Filter type: : Filter type P2

The entrepreneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.

Hand protection

Material : Nitrile rubber

Aldrich - 579211

Page 6 of 14

The life science business of Merck KGaA, Darmstadt, Germany operates as MilliporeSigma in the US and Canada

**Millipore**  
**Sigma**

|                          |   |   |
|--------------------------|---|---|
| Break through time       | : | 480 min   |
| Glove thickness          | : | 0.11 mm   |
| Protective index         | : | Full contact  |
| Manufacturer             | : | KCL 741 Dermatril® L  |
|                          |   |   |
| Material                 | : | Nitrile rubber  |
| Break through time       | : | 480 min   |
| Glove thickness          | : | 0.11 mm   |
| Protective index         | : | Splash contact  |
| Manufacturer             | : | KCL 741 Dermatril® L  |
|                          |   |   |
| Remarks                  | : | <p>Handle with impervious gloves.</p> <p>This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN 16523-1 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: <a href="http://www.kcl.de">www.kcl.de</a>).</p> |
|                          |   |   |
| Eye protection           | : | <p>Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).</p> <p>Safety glasses</p>  |
|                          |   |   |
| Skin and body protection | : | Flame retardant antistatic protective clothing.   |
|                          |   |   |
| Hygiene measures         | : | Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.   |

---

## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

|                             |   |   |
|-----------------------------|---|---|
| Appearance                  | : | solid                                     |
| Color                       | : | No data available                         |
| Odor                        | : | No data available                         |
| Odor Threshold              | : | No data available                         |
| pH                          | : | No data available                         |
| Melting point/ range        | : | 135 - 140 °F / 57 - 60 °C<br>Method: lit. |
| Boiling point/boiling range | : | No data available                         |
| Flash point                 | : | > 149 °F / > 65 °C                        |

|   |  |
|---|--|
| Evaporation rate                                    | : No data available  |
| Flammability (solid, gas)                           | : The substance or mixture is a flammable solid with the category 1. |
| Flammability (liquids)                              | : No data available  |
| Burning rate  | : No data available  |
| Upper explosion limit /<br>Upper flammability limit | : No data available  |
| Lower explosion limit /<br>Lower flammability limit | : No data available  |
| Vapor pressure                                      | : No data available  |
| Relative vapour density                             | : No data available  |
| Relative density                                    | : No data available  |
| Density   | : No data available  |
| Water solubility                                    | : No data available  |
| Partition coefficient: n-<br>octanol/water          | : No data available  |
| Autoignition temperature                            | : No data available  |
| Decomposition<br>temperature                        | : No data available  |
| Viscosity, dynamic                                  | : No data available  |
| Viscosity, kinematic                                | : No data available  |
| Flow time   | : No data available  |
| Explosive properties                                | : No data available  |
| Oxidizing properties                                | : none   |
| Molecular weight                                    | : 267.53 g/mol   |
| Particle characteristics                            |  |
| Particle size                                       | : No data available  |

---

## SECTION 10. STABILITY AND REACTIVITY

|                                    |   |
|------------------------------------|---|
| Reactivity                         | : The following applies in general to flammable organic substances and mixtures: in correspondingly fine distribution, when whirled up a dust explosion potential may generally be assumed. |
| Chemical stability                 | : sensitive to moisture   |
| Possibility of hazardous reactions | : No data available   |
| Conditions to avoid                | : Do not allow water to enter container.<br>Moisture.   |
| Incompatible materials             | : Strong oxidizing agents   |
| Hazardous decomposition products   | : In the event of fire: see section 5   |

---

## SECTION 11. TOXICOLOGICAL INFORMATION

### 11.1 Information on toxicological effects

#### **Acute toxicity**

Oral: No data available  
 Inhalation: No data available  
 Dermal: No data available  
 No data available

#### **Skin corrosion/irritation**

Remarks: No data available

#### **Serious eye damage/eye irritation**

Remarks: No data available

#### **Respiratory or skin sensitization**

No data available

#### **Germ cell mutagenicity**

No data available

#### **Carcinogenicity**

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.  
 NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.  
 OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

#### **Reproductive toxicity**

No data available  
 No data available

#### **Specific target organ toxicity - single exposure**

Inhalation - May cause respiratory irritation.

**Specific target organ toxicity - repeated exposure**

No data available

**Aspiration hazard**

No data available

**11.2 Additional Information**

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

---

**SECTION 12. ECOLOGICAL INFORMATION****Ecotoxicity**

No data available

**Persistence and degradability****Components:****Tetrakis(dimethylamido)zirconium(IV):**

Biodegradability : Remarks: No data available

**Bioaccumulative potential****Components:****Tetrakis(dimethylamido)zirconium(IV):**

Bioaccumulation : Remarks: No data available

**Mobility in soil****Components:****Tetrakis(dimethylamido)zirconium(IV):**

Stability in soil : Remarks: No data available

**Other adverse effects****Components:****Tetrakis(dimethylamido)zirconium(IV):**

Additional ecological : No data available information

---

**SECTION 13. DISPOSAL CONSIDERATIONS****Disposal methods**

Waste from residues : Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product

itself.

---

## SECTION 14. TRANSPORT INFORMATION

### International Regulations

#### IATA-DGR

|  |   |   |
|--|---|---|
| UN/ID No.                                | : | UN 3396   |
| Proper shipping name                     | : | Organometallic substance, solid, water-reactive, flammable<br>(Tetrakis(dimethylamido)zirconium(IV))        |
| Class                                    | : | 4.3   |
| Subsidiary risk                          | : | 4.1   |
| Packing group                            | : | II  |
| Labels                                   | : | Division 4.3 - Substances which in contact with water emit flammable gases, Division 4.1 - Flammable solids |
| Packing instruction (cargo aircraft)     | : | 489   |
| Packing instruction (passenger aircraft) | : | 483   |

#### IMDG-Code

|                      |   |  |
|----------------------|---|--|
| UN number            | : | UN 3396  |
| Proper shipping name | : | ORGANOMETALLIC SUBSTANCE, SOLID, WATER-REACTIVE, FLAMMABLE<br>(Tetrakis(dimethylamido)zirconium(IV)) |
| Class                | : | 4.3  |
| Subsidiary risk      | : | 4.1  |
| Packing group        | : | II   |
| Labels               | : | 4.3 (4.1)  |
| EmS Code             | : | <u>F-G</u> , S-N   |
| Marine pollutant     | : | no   |

### Transport in bulk according to IMO instruments

Not applicable for product as supplied.

### National Regulations

#### 49 CFR Road

|                      |   |   |
|----------------------|---|---|
| UN/ID/NA number      | : | UN 3396   |
| Proper shipping name | : | Organometallic substance, solid, water-reactive, flammable<br>(Tetrakis(dimethylamido)zirconium(IV))        |
| Class                | : | 4.3   |
| Subsidiary risk      | : | 4.1   |
| Packing group        | : | II  |
| Labels               | : | Division 4.3 - Substances which in contact with water emit flammable gases, Division 4.1 - Flammable solids |
| ERG Code             | : | 138   |
| Marine pollutant     | : | no  |

Poison Inhalation Hazard : No

## **Special precautions for user**

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

---

## **SECTION 15. REGULATORY INFORMATION**

### **CERCLA Reportable Quantity**

This material does not contain any components with a CERCLA RQ.

### **SARA 304 Extremely Hazardous Substances Reportable Quantity**

This material does not contain any components with a section 304 EHS RQ.

### **SARA 302 Extremely Hazardous Substances Threshold Planning Quantity**

This material does not contain any components with a section 302 EHS TPQ.

**SARA 311/312 Hazards** : Reactivity Hazard  
Acute Health Hazard

**SARA 313** : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

## **US State Regulations**

### **Massachusetts Right To Know**

No components are subject to the Massachusetts Right to Know Act.

### **Maine Chemicals of High Concern**

Product does not contain any listed chemicals

### **Vermont Chemicals of High Concern**

Product does not contain any listed chemicals

### **Washington Chemicals of High Concern**

Product does not contain any listed chemicals

### **The components of this product are reported in the following inventories:**

**TSCA** : Product contains substance(s) not listed on TSCA inventory.

### **TSCA list**

No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

---

## **SECTION 16. OTHER INFORMATION**

### **Full text of other abbreviations**

Aldrich - 579211

Page 12 of 14

The life science business of Merck KGaA, Darmstadt, Germany  
operates as MilliporeSigma in the US and Canada

**Millipore  
Sigma**

|                 |   |
|-----------------|---|
| ACGIH           | : USA. ACGIH Threshold Limit Values (TLV)   |
| NIOSH REL       | : USA. NIOSH Recommended Exposure Limits  |
| OSHA Z-1        | : USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants          |
| ACGIH / TWA     | : 8-hour, time-weighted average   |
| ACGIH / STEL    | : Short-term exposure limit   |
| NIOSH REL / TWA | : Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek |
| NIOSH REL / ST  | : STEL - 15-minute TWA exposure that should not be exceeded at any time during a workday    |
| OSHA Z-1 / TWA  | : 8-hour time weighted average  |

AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonised System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECS - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organisation; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardisation; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organisation for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

The information is believed to be correct but is not exhaustive and will be used solely as a guideline, which is based on current knowledge of the chemical substance or mixture and is applicable to appropriate safety precautions for the product. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above

product. See [www.sigma-aldrich.com](http://www.sigma-aldrich.com) and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Copyright 2025 Sigma-Aldrich Co. LLC. License granted to make unlimited paper copies for internal use only.

Revision Date : 11/06/2025

The branding on the header and/or footer of this document may temporarily not visually match the product purchased as we transition our branding. However, all of the information in the document regarding the product remains unchanged and matches the product ordered. For further information please contact [mlsbranding@sial.com](mailto:mlsbranding@sial.com).

US / EN