

**SAFETY DATA SHEET: Tantalum doped Lithium Lanthanum Zirconate Garnet Membrane, LLZTO, cubic phase**

**Version: 1.2**

**Revision Date:05-05-2020**

Section 1: Identification

**1.1) Product identifier:**

Product Name : Tantalum doped Lithium Lanthanum Zirconate Garnet Membrane  
Synonyms : LLZTO  
Product Number : ME0111  
CAS Number : NA

**1.2) Company information:**

Address: MSE Supplies, LLC  
4400 E Broadway Blvd, Suite 600  
Tucson, AZ 85711, USA  
Telephone: +1 520-789-6673  
Email: [info@mse Supplies.com](mailto:info@mse Supplies.com)  
Emergency Telephone : +1-703-527-3887

**1.3) Relevant identified uses of the substance or mixture and uses advised against:**

Identifies uses: Solid State Electrolyte, Scientific research and development

Section 2: Hazard(s) Identification

**2.1) Classification of the substance or mixture GHS classification in accordance with 29 CFR 1910 (OSHA HCS):**

Not a hazardous substance or mixture.

**2.2) GHS Label elements, including precautionary statements:**

Not a hazardous substance or mixture.

**2.3) Hazards not otherwise classified (HNOC) or covered by GHS:**

None

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Section 3: Composition/Information on Ingredients

**3.1) Substances:**

Formula:  $\text{Li}_{6.4}\text{La}_3\text{Zr}_{1.4}\text{Ta}_{0.6}\text{O}_{12}$   
 Formula Weight: 889.30 g/mol  
 CAS Number: NA

Component	Classification	Concentration
La <sub>2</sub> O <sub>3</sub> CAS# - 1312-81-8		0 – 100%
ZrO <sub>2</sub> CAS# - 7440-67-7		0 – 100%
Ta <sub>2</sub> O <sub>5</sub> CAS# - 1314-61-0		0 – 100%
Li <sub>2</sub> CO <sub>3</sub> CAS# - 554-13-2		0 – 100%

Composition comments: The exact percentage is withheld as a trade secret in accordance with 29 CFR 1910.1200.

Section 4: First-Aid Measures

**4.1) Description of first aid measures:**

**General advice**

Move out of dangerous area.

**If inhaled**

If breathed in, move person into fresh air. If not breathing, give artificial respiration.

**In case of skin contact**

Wash off with soap and plenty of water.

**In case of eye contact**

Flush eyes with water as a precaution.

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**If swallowed**

Never give anything by mouth to an unconscious person. Rinse mouth with water.

**4.2) 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.

**4.3) Indication of any immediate medical attention and special treatment needed:**

No data available

Section 5: Fire-Fighting Measures

**5.1) Suitable extinguishing media:**

The product is not flammable. Extinguish with alcohol-resistant foam, carbon dioxide, dry powder or water fog. Use fire-extinguishing media suitable for the surrounding fire.

**5.2) Special hazards arising from the substance or mixture:**

None.

**5.3) Advise for firefighters:**

Wear self-contained breathing apparatus for firefighting if necessary.

**5.4) Further information:**

None.

Section 6: Accidental Release Measures

**6.1) Personal precautions, protective equipment, and emergency procedures:**

Avoid dust formation. Avoid breathing vapors, mist, or gas.  
For personal protection see section 8.

**6.2) Environmental precautions:**

No special environmental precautions required.

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**6.3) Methods and materials for containment and cleaning up:**

Sweep up and shovel. Keep in suitable, closed containers for disposal.

**6.4) Reference to other sections:**

For disposal see section 13.

Section 7: Handling and Storage

**7.1) Precautions for safe handling:**

Wear protective clothing as described in Section 8 of this safety data sheet. Keep away from food, drink and animal feeding stuffs. Keep container tightly sealed when not in use.

**7.2) Conditions for safe storage, including any incompatibilities:**

Store the material in inert gas protected glove box or dry room. Avoid moisture.

**7.3) Specific end use(s):**

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

Section 8: Exposure Controls/Personal Protection

**8.1) Control parameters:**

**Components with workplace control parameters**

Contains no substances with occupational exposure limit values.

**8.2) Exposure controls:**

**Appropriate engineering controls:**

General industrial hygiene practice.

**Personal protective equipment**

**Eye/face protection:**

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Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

**Skin protection:**

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm

Break through time: 480 min

Material tested: Dermatril® (KCL 740)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300,  
e-mail sales@kcl.de, test method: EN374

If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

**Body protection:**

Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

**Respiratory protection:**

Respiratory protection is not required. Where protection from nuisance levels of dusts are desired, use type N95 (US) or type P1 (EN 143) dust masks. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

**Control of environmental exposure:**

No special environmental precautions required.

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Section 9: Physical and Chemical Properties

**9.2) Information on basic physical and chemical properties:**

a) Appearance (physical state, color, etc.)	Solid White pressed material
b) Upper/lower flammability or explosive limits	
c) Odor	odorless
d) Odor threshold	No data available
e) Vapor pressure	No data available
f) Vapor density	No data available
g) pH	8 ~ 9
h) Density	No data available
i) Melting point/freezing point	~1350 C
j) Solubility(ies)	No data available
k) Initial boiling point and boiling range	No data available
l) Flash point	No data available
m) Evaporation rate	No data available
n) Flammability (solid, gas)	No data available
o) Partition coefficient: n-octanol/water	No data available
q) Auto-ignition temperature	No data available
r) Decomposition temperature	No data available
s) Viscosity	No data available
t) Explosive properties	No data available
u) Oxidizing properties	No data available

**9.2) Other Safety information:**

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No data available

## Section 10: Stability and Reactivity

**10.1) Reactivity:**

No data available

**10.2) Chemical Stability:**

Stable under recommended storage conditions.

**10.3) Possibility of hazardous reactions:**

No data available

**10.4) Conditions to avoid:**

No data available

**10.5) Incompatible materials:**

No data available

**10.6) Hazardous decomposition products:**

In the event of a fire: see section 5.

## Section 11: Toxicological Information

**11.1) Information on toxicological effects:**

**Acute toxicity:**

No data available

**Skin corrosion/irritation:**

No data available

**Serious eye damage/ eye irritation:**

No data available

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**Respiratory or skin sensitization:**

No data available

**Germ cell mutagenicity:**

No data available

**Carcinogenicity:**

No data available

**Reproductive toxicity:**

No data available

**Specific target organ toxicity – single exposure:**

No data available

**Specific target organ toxicity – repeated exposure:**

No data available

**Aspiration hazard:**

No data available

**Additional information:**

No data available

Section 12: Ecological Information

**12.1) Toxicity:**

No data available

**12.2) Persistence and degradability:**

No data available

**12.3) Bioaccumulative potential:**

No data available

**12.4) Mobility in soil:**

No data available



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**12.5) Results of PBT and vPvB assessment:**

No data available

**12.6) Other adverse effects:**

No data available

Section 13: Disposal Considerations

**13.1) Waste treatment methods:**

**Product:**

Waste must be disposed of in accordance with federal, state and local environmental control regulations

**Contaminated packaging:**

Waste must be disposed of in accordance with federal, state and local environmental control regulations

Section 14: Transport Information

**DOT (US):**

Not dangerous goods

**IMDG:**

Not dangerous goods

**IATA:**

Not dangerous goods

Section 15: Regulatory Information



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**SARA 302 Components:**

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

**SARA 313 Components:**

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.

**SARA 311/312 Hazards:**

No SARA Hazards

**Massachusetts Right To Know Components:**

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

**Pennsylvania Right To Know Components:**

Some of the ingredients are listed or exempt.

**New Jersey Right To Know Components:**

Some of the ingredients are listed or exempt.

**California Prop. 65 Components:**

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

Section 16: Other Information

**Further information**

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. MSE Supplies LLC and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product.

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