1. Product and Company Identification

Product Name: Lithium Titanate
Lithium Titanate Spinel Oxide

CAS#: 12031-95-7

Chemical Formula: Li₄Ti₅O₁₂

Identified uses: Laboratory chemicals, Manufacture of substances

Contact Information: MTI Corporation
860 South 19th Street
Richmond, CA 94804, USA
Tel: 510-525-3070
Fax: 510-525-4705
Email: info@mtixtl.com
Website: www.mtixtl.com

Non-emergency assistance: 1-888-525-3070
Emergency assistance: CHEMTEL (MTI Contract# MIS2559467) Day or Night
Tel (Within USA and Canada): 1-800-255-3924
Tel (Outside USA and Canada): 1-813-248-0585

2. Hazards Identification

Emergency Overview: GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Acute toxicity, Oral (Category 4), H302
Skin irritation (Category 2), H315
Eye irritation (Category 2A), H319
Specific target organ toxicity - single exposure (Category 3), Respiratory system, H335

For the full text of the H-Statements mentioned in this Section, see Section 16.

HMIS Rating
Health hazard: 2
Chronic Health Hazard:
Flammability: 0
Physical Hazard 0

NFPA Rating
Health hazard: 2
Fire Hazard: 0
Reactivity Hazard: 0

GHS Label elements, including precautionary statements

<table>
<thead>
<tr>
<th>Pictogram</th>
<th>Signal</th>
<th>Hazard statement(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Safety Data Sheet]</td>
<td>Warning</td>
<td>H302 Harmful if swallowed.</td>
</tr>
</tbody>
</table>
Lithium titanate spinel oxide

Revision Date: May 2018

MTI Corporation

Safety Data Sheet

H315 Causes skin irritation.
H319 Causes serious respiratory irritation.
H335 May cause respiratory irritation.

Precautionary statement(s)
P261 Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray.
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P271 Use only outdoors or in a well-ventilated area.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P312 IF SWALLOWED: Call a POISON CENTER or doctor/ physician if you feel unwell.
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P312 Call a POISON CENTER or doctor/ physician if you feel unwell.
P321 Specific treatment (see supplemental first aid instructions on this label)
P330 Rinse mouth.
P332 + P313 If skin irritation occurs: Get medical advice/ attention.
P337 + P313 If eye irritation persists: Get medical advice/ attention.
P362 Take off contaminated clothing and wash before reuse.
P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
P405 Store locked up.
P501 Dispose of contents/ container to an approved waste disposal plant.

Hazard not otherwise classified (HNOC) or not covered by GHS
none

3. Composition/Information on Ingredients

Substance Name: Lithium titanate spinel oxide
LTO
Formula: Li₄Ti₅O₁₂
Molecular Weight: 459.09 g/mol
CAS NO.: 12031-95-7

Hazardous Components
N-methyl-2-pyrrolidone Included in the Candidate List of Substances of Very High Concern (SVHC) according to Regulation (EC) No. 1907/2006 (REACH)

<table>
<thead>
<tr>
<th>Substance Name</th>
<th>CAS-No.</th>
<th>Health Hazard(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lithium titanate spinel oxide</td>
<td>12031-95-7</td>
<td>Acute Tox. 4; Skin Irrit. 2; Eye Irrit. 2A; STOT SE 3; H302, H315, H319, H335</td>
</tr>
</tbody>
</table>

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. First Aid Measures

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.
In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

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

5. Firefighting Measures
5.1 Extinguishing media
Suitable extinguishing media
Use water spray, alcohol resistant-foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance mixture
Titanium/titanium oxides, Lithium oxides

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further Information
No data available

6. Accidental Release Measures
6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid dust formation. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.

6.2 Environmental precautions
Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. Handling and Storage
7.1 Precautions for safe handling
Avoid contact with skin and eyes Avoid formation of dust and aerosols.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.
8. Exposure Control/ 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
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Safety glasses with side-shields conforming to EN166 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.

Body Protection
Complete suit protecting against chemicals, Flame retardant antistatic protective clothing. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
For nuisance exposures use type P95 (US) or type P1 (EU EN 143) particle respirator. For higher level protection use type OV/AG/P99 (US) or type ABEK-P2 (EU EN 143) respirator cartridges. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Do not let product enter drains.

9. Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

a) Appearance
   Form: Powder
   Color: White

b) Odor
   No data available

c) Odor Threshold
   No data available
d) pH  
No data available

e) Melting point/freezing point  
Melting point/freezing point: > 1,000 °C (> 1,832 °F)

f) Initial boiling point and boiling range  
No data available

g) Flash point  
No data available

h) Evaporation rate  
No data available

i) Flammability (solid, gas)  
No data available

j) Upper/lower flammability or explosive limits  
No data available

k) Vapor pressure  
No data available

l) Vapor density  
No data available

m) Relative density  
3.5 g/cm³ at 20 °C (68 °F)

n) Water solubility  
No data available

o) Partition coefficient: n-octanol/water  
No data available

p) Auto-ignition temperature  
No data available

q) Decomposition temperature  
No data available

r) Viscosity  
No data available

s) Explosive properties  
No data available

t) Oxidizing properties  
No data available

9.2 Other safety information  
No data available

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  
Other decomposition products - No data available
In the event of fire: see section 5

11. Toxicological Information

11.1 Information on toxicological effects

Acute toxicity  
No data available

Inhalation  No data available

Dermal  No data available

No data available
Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
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.
ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
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 identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available

Specific target organ toxicity - single exposure
Inhalation - May cause respiratory irritation.
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: Not available
Dizziness, Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea., Weakness, Convulsions, To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

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

12.5 Results of PBT and vPvB assessment PBT/vPvB assessment
Not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
No data available
13. Disposal Considerations

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

14. Transport Information

DOT (US)
Not dangerous goods

IMDG
Not dangerous goods

IATA
Not dangerous goods

15. Regulatory Information

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
Acute Health Hazard

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

Pennsylvania Right to Know Components
Lithium Titanate Spinel Oxide 12037-95-7 2007-07-01

New Jersey Right to Know Components
Lithium Titanate Spinel Oxide 12037-95-7 2007-07-01

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.

16. Other Information

Acute Tox. Acute toxicity
Eye Irrit. Eye irritation
H302 Harmful if swallowed.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H335 May cause respiratory irritation.
Skin Irrit. Skin irritation

The information above is believed to be accurate and represents the best information currently available to us. However, it does not represent any guarantee of the properties of the product. We make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we shall not be held liable for any damage resulting from handling or from contact with the above product. Users should make their own investigations to determine the suitability of the information for their particular purposes.