SECTION 1: IDENTIFICATION

1.1. Product Identifier

Product Form: Substance
Product Name: Lanthanum Strontium Manganite
CAS No: 66402-68-4
Synonyms: LSM; LSMO; Lanthanum Strontium Manganese Oxide

1.2. Intended Use of the Product

Laboratory chemicals and manufacture of substances

1.3. Name, Address, and Telephone of the Supplier Company

Fuel Cell Store
1902 Pinon Drive, Unit B
College Station, Texas, USA 77845
T 979 703-1925

www.fuelcellstore.com
info@fuelcellstore.com

1.4. Emergency Telephone Number

Emergency Number: INFOTRAC: 1-800-535-5053

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the Substance or Mixture

Classification (GHS-US)
Skin Corr. 1B H314
Eye Dam. 1 H318
Full text of H-phrases: see section 16

2.2. Label Elements

GHS-US Labeling
Hazard Pictograms (GHS-US): 

Signal Word (GHS-US): Danger
Precautionary Statements (GHS-US):
P260 - Do not breathe dusts, mists.
P264 - Wash hands, forearms, and other exposed areas thoroughly after handling.
P280 - Wear eye protection, face shield, protective clothing, protective gloves.
P301+P330+P331 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
P303+P361+P353 - IF ON SKIN (OR HAIR): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304+P340 - IF INHALED: Remove person 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.
P310 - Immediately call a poison center or doctor.
P321 - Specific treatment (see section 4 on this SDS).
P363 - Wash contaminated clothing before reuse.
P405 - Store locked up.
P501 - Dispose of contents/container in accordance with local, regional, provincial, territorial, national, and international regulations.
Lanthanum Strontium Manganite
Safety Data Sheet
According To Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules And Regulations

2.3. Other Hazards
Exposure may aggravate those with pre-existing eye, skin, or respiratory conditions.

2.4. Unknown Acute Toxicity (GHS-US) No data available

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances

<table>
<thead>
<tr>
<th>Name</th>
<th>Product Identifier</th>
<th>% (w/w)</th>
<th>Classification (GHS-US)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ceramic materials and wares, chemicals</td>
<td>(CAS No) 66402-68-4</td>
<td>100</td>
<td>Eye Dam. 1, H318</td>
</tr>
<tr>
<td>Contains</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lanthanum oxide (La₂O₃)</td>
<td>(CAS No) 1312-81-8</td>
<td>1 - 69</td>
<td>Not classified</td>
</tr>
<tr>
<td>Strontium oxide (SrO)</td>
<td>(CAS No) 1314-11-0</td>
<td>1 - 5; 5 - 10; 10 - 30; 30 - 59*</td>
<td>Skin Corr. 1B, H314</td>
</tr>
<tr>
<td>Manganese oxide (Mn₃O₄)</td>
<td>(CAS No) 1317-35-7</td>
<td>30 - 45</td>
<td>Not classified</td>
</tr>
</tbody>
</table>

3.2. Mixture
Not applicable
*More than one of the ranges of concentration prescribed by the Controlled Products Regulations has been used where necessary, due to varying composition.
Full text of H-phrases: see section 16

SECTION 4: FIRST AID MEASURES

4.1. Description of First Aid Measures
General: Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible). IF exposed or concerned: Call a POISON CENTER or doctor/physician.
Inhalation: When symptoms occur: go into open air and ventilate suspected area. Remove to fresh air and keep at rest in a position comfortable for breathing. If exposed or concerned: Get medical advice/attention.
Skin Contact: Immediately flush skin with plenty of water for at least 60 minutes. Remove/Take off immediately all contaminated clothing. Seek medical attention for thermal burns. Wash contaminated clothing before reuse.
Eye Contact: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing for at least 60 minutes. Immediately call a POISON CENTER or doctor/physician.
Ingestion: Rinse mouth. Do NOT induce vomiting. If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label.

4.2. Most Important Symptoms and Effects Both Acute and Delayed
General: Causes severe skin burns and eye damage.
Inhalation: Prolonged inhalation of dust may cause respiratory irritation.
Skin Contact: Prolonged exposure may cause skin irritation. Corrosive. Causes burns. Symptoms may include: Redness. Pain. Serious skin burns. Blisters.
Eye Contact: Causes permanent damage to the cornea, iris, or conjunctiva. Symptoms may include: Redness. Pain. Blurred vision. Severe burns.
Ingestion: May cause burns or irritation of the linings of the mouth, throat, and gastrointestinal tract.
Chronic Symptoms: None expected under normal conditions of use.

4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed
If exposed or concerned, get medical advice and attention.

SECTION 5: FIRE-FIGHTING MEASURES

5.1. Extinguishing Media
Suitable Extinguishing Media: Use extinguishing media appropriate for surrounding fire.
Unsuitable Extinguishing Media: Do not use water jet. Use of heavy stream of water may spread fire.

5.2. Special Hazards Arising From the Substance or Mixture
Fire Hazard: Product is not flammable.
Explosion Hazard: Product itself is not explosive, but if dust is generated, dust clouds suspended in air can be explosive.
Reactivity: Hazardous reactions will not occur under normal conditions.
Lanthanum Strontium Manganite
Safety Data Sheet
According To Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules And Regulations

5.3. Advice for Firefighters
Precautionary Measures Fire: Exercise caution when fighting any chemical fire. Under fire conditions, hazardous fumes will be present.
Firefighting Instructions: Avoid dust clouds in combination with static electricity. Avoid inhalation of material or combustion by-products.
Protection During Firefighting: Do not enter fire area without proper protective equipment, including respiratory protection.
Hazardous Combustion Products: Oxides of carbon, strontium, manganese, lanthanum.
Other Information: Do not allow run-off from fire fighting to enter drains or water sources.

Reference to Other Sections
Refer to section 9 for flammability properties.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal Precautions, Protective Equipment and Emergency Procedures
General Measures: Avoid all contact with skin, eyes, or clothing. Avoid breathing dust. Remove ignition sources. Use special care to avoid static electric charges.
6.1.1. For Non-Emergency Personnel
Protective Equipment: Use appropriate personal protection equipment (PPE).
6.1.2. For Emergency Personnel
Protective Equipment: Use appropriate personal protection equipment (PPE).
Emergency Procedures: Stop leak if safe to do so. Ventilate area.

6.2. Environmental Precautions
Prevent entry to sewers and public waters. Contact competent authorities after a spill.

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. Absorb and/or contain spill with inert material, then place in suitable container. Do not take up in combustible material such as: saw dust or cellulosic material.
Methods for Cleaning Up: Clean up spills immediately and dispose of waste safely. Collect spillage. Utilize a dust suppressant when removing mechanically.

6.4. Reference to Other Sections
See Section 8, Exposure Controls and Personal Protection. See Section 13, Disposal Considerations.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for Safe Handling
Additional Hazards When Processed: Accumulation and dispersion of dust with an ignition source can cause a combustible dust explosion. Keep dust levels to a minimum and follow applicable regulations. Dry powders can build static electricity charges when subjected to the friction of transfer and mixing operations. Provide adequate precautions, such as electrical grounding and bonding, or inert atmospheres.
Hygiene Measures: Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking, or smoking and again when leaving work. Wash hands and forearms thoroughly after handling. Do not eat, drink, or smoke when using this product. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reuse.

7.2. Conditions for Safe Storage, Including Any Incompatibilities
Technical Measures: Ground/bond container and receiving equipment. Use explosion-proof lighting, ventilating equipment. Good housekeeping is needed during storage, transfer, handling, and use of this material to avoid excessive dust accumulation.
Storage Conditions: Store in a dry, cool, and well-ventilated place. Keep container closed when not in use. Keep in fireproof place.
Storage Area: Store locked up. Store in a well-ventilated place. Keep cool.

7.3. Specific End Use(s) Laboratory chemicals and manufacture of substances

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control Parameters
For substances listed in section 3 that are not listed here, there are no established Exposure limits from the manufacturer, supplier, importer, or the appropriate advisory agency including: ACGIH (TLV), NIOSH (REL), OSHA (PEL), Canadian provincial governments, or the Mexican government.
Lanthanum Strontium Manganite

Safety Data Sheet

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

<table>
<thead>
<tr>
<th>Manganese oxide (Mn3O4) (1317-35-7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nunavut OEL STEL (mg/m³)</td>
</tr>
<tr>
<td>Nunavut OEL TWA (mg/m³)</td>
</tr>
<tr>
<td>Northwest Territories OEL STEL (mg/m³)</td>
</tr>
<tr>
<td>Northwest Territories OEL TWA (mg/m³)</td>
</tr>
<tr>
<td>Québec VEMP (mg/m³)</td>
</tr>
</tbody>
</table>

8.2. Exposure Controls

**Appropriate Engineering Controls:** Proper grounding procedures to avoid static electricity should be followed. Ensure all national/local regulations are observed. Provide adequate ventilation to minimize dust concentrations. Ensure adequate ventilation, especially in confined areas. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.


**Materials for Protective Clothing:** Corrosionproof clothing.

**Hand Protection:** Impermeable protective gloves.

**Eye Protection:** Chemical safety goggles and face shield.

**Skin and Body Protection:** In case of dust production: dustproof clothing. Corrosionproof clothing.

**Respiratory Protection:** If exposure limits are exceeded or irritation is experienced, approved respiratory protection should be worn.

**Other Information:** When using, do not eat, drink, or smoke.

### SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

#### 9.1. Information on Basic Physical and Chemical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical State</td>
<td>Solid</td>
</tr>
<tr>
<td>Appearance</td>
<td>Black/gray</td>
</tr>
<tr>
<td>Odor</td>
<td>Not available</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>Not available</td>
</tr>
<tr>
<td>pH</td>
<td>Not available</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>Not available</td>
</tr>
<tr>
<td>Melting Point</td>
<td>&gt; 1650 °C (&gt; 3002 °F)</td>
</tr>
<tr>
<td>Freezing Point</td>
<td>Not available</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>Not available</td>
</tr>
<tr>
<td>Flash Point</td>
<td>Not available</td>
</tr>
<tr>
<td>Auto-ignition Temperature</td>
<td>Not available</td>
</tr>
<tr>
<td>Decomposition Temperature</td>
<td>Not available</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>Not available</td>
</tr>
<tr>
<td>Lower Flammable Limit</td>
<td>Not available</td>
</tr>
<tr>
<td>Upper Flammable Limit</td>
<td>Not available</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>Not available</td>
</tr>
<tr>
<td>Relative Vapor Density at 20 °C</td>
<td>Not available</td>
</tr>
<tr>
<td>Relative Density</td>
<td>Not available</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>Not available</td>
</tr>
<tr>
<td>Solubility</td>
<td>Not available</td>
</tr>
<tr>
<td>Partition Coefficient: N-Octanol/Water</td>
<td>Not available</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Not available</td>
</tr>
<tr>
<td>Explosion Data – Sensitivity to Mechanical Impact</td>
<td>Not expected to present an explosion hazard due to mechanical impact.</td>
</tr>
<tr>
<td>Explosion Data – Sensitivity to Static Discharge</td>
<td>Static discharge could act as an ignition source.</td>
</tr>
</tbody>
</table>
Lanthanum Strontium Manganite

Safety Data Sheet

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

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity: Hazardous reactions will not occur under normal conditions.

10.2. Chemical Stability: Stable under normal ambient conditions.

10.3. Possibility of Hazardous Reactions: Hazardous polymerization will not occur.


SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on Toxicological Effects - Product

Acute Toxicity: Not classified
LD50 and LC50 Data: Not available

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

Teratogenicity: Not classified

Carcinogenicity: Not classified

Specific Target Organ Toxicity (Repeated Exposure): Not classified

Reproductive Toxicity: Not classified

Specific Target Organ Toxicity (Single Exposure): Not classified

Aspiration Hazard: Not classified

Symptoms/Injuries After Inhalation: Prolonged inhalation of dust may cause respiratory irritation.


Symptoms/Injuries After Eye Contact: Causes permanent damage to the cornea, iris, or conjunctiva. Symptoms may include: Redness. Pain. Blurred vision. Severe burns.

Symptoms/Injuries After Ingestion: Ingestion is likely to be harmful or have adverse effects.

Chronic Symptoms: None expected under normal conditions of use.

11.2. Information on Toxicological Effects - Ingredient(s)

LD50 and LC50 Data: Not available

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity: No additional information available

12.2. Persistence and Degradability: Not available

12.3. Bioaccumulative Potential: Not available

12.4. Mobility in Soil: Not available

12.5. Other Adverse Effects

Other Information: Avoid release to the environment.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Sewage Treatment Recommendations: Do not empty into drains; dispose of this material and its container in a safe way.

Waste Disposal Recommendations: Dispose of waste material in accordance with all local, regional, national, provincial, territorial and international regulations.

SECTION 14: TRANSPORT INFORMATION

14.1. In Accordance with DOT

Proper Shipping Name: CORROSIVE SOLIDS, N.O.S. (Strontium oxide)

Hazard Class: 8

Identification Number: UN1759
# Lanthanum Strontium Manganite

## Safety Data Sheet

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

### Label Codes
- : 8

### Packing Group
- : II

### ERG Number
- : 154

14.2. **In Accordance with IMDG**

<table>
<thead>
<tr>
<th>Proper Shipping Name</th>
<th>CORROSIVE SOLID, N.O.S. (Strontium oxide)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazard Class</td>
<td>8</td>
</tr>
<tr>
<td>Identification Number</td>
<td>UN1759</td>
</tr>
<tr>
<td>Packing Group</td>
<td>II</td>
</tr>
<tr>
<td>Label Codes</td>
<td>8</td>
</tr>
<tr>
<td>EmS-No. (Fire)</td>
<td>F-A</td>
</tr>
<tr>
<td>EmS-No. (Spillage)</td>
<td>S-B</td>
</tr>
</tbody>
</table>

14.3. **In Accordance with IATA**

<table>
<thead>
<tr>
<th>Proper Shipping Name</th>
<th>CORROSIVE SOLID, N.O.S. (Strontium oxide)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Packing Group</td>
<td>II</td>
</tr>
<tr>
<td>Identification Number</td>
<td>UN1759</td>
</tr>
<tr>
<td>Hazard Class</td>
<td>8</td>
</tr>
<tr>
<td>Label Codes</td>
<td>8</td>
</tr>
<tr>
<td>ERG Code (IATA)</td>
<td>8L</td>
</tr>
</tbody>
</table>

14.4. **In Accordance with TDG**

<table>
<thead>
<tr>
<th>Proper Shipping Name</th>
<th>CORROSIVE SOLID, N.O.S. (Strontium oxide)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Packing Group</td>
<td>II</td>
</tr>
<tr>
<td>Hazard Class</td>
<td>8</td>
</tr>
<tr>
<td>Identification Number</td>
<td>UN1759</td>
</tr>
<tr>
<td>Label Codes</td>
<td>8</td>
</tr>
</tbody>
</table>

### SECTION 15: REGULATORY INFORMATION

#### 15.1. US Federal Regulations

<table>
<thead>
<tr>
<th>Lanthanum Strontium Manganite (66402-68-4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SARA Section 311/312 Hazard Classes</td>
</tr>
<tr>
<td>Ceramic materials and wares, chemicals (66402-68-4)</td>
</tr>
<tr>
<td>Listed on the United States TSCA (Toxic Substances Control Act) inventory</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Strontium oxide (SrO) (1314-11-0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Listed on the United States TSCA (Toxic Substances Control Act) inventory</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lanthanum oxide (La2O3) (1312-81-8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Listed on the United States TSCA (Toxic Substances Control Act) inventory</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Manganese oxide (Mn3O4) (1317-35-7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Listed on the United States TSCA (Toxic Substances Control Act) inventory</td>
</tr>
</tbody>
</table>

#### 15.2. US State Regulations

<table>
<thead>
<tr>
<th>Ceramic materials and wares, chemicals (66402-68-4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. - Texas - Effects Screening Levels - Long Term</td>
</tr>
<tr>
<td>U.S. - Texas - Effects Screening Levels - Short Term</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lanthanum oxide (La2O3) (1312-81-8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. - Texas - Effects Screening Levels - Long Term</td>
</tr>
<tr>
<td>U.S. - Texas - Effects Screening Levels - Short Term</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Manganese oxide (Mn3O4) (1317-35-7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. - Connecticut - Hazardous Air Pollutants - HLVs (30 min)</td>
</tr>
<tr>
<td>U.S. - Connecticut - Hazardous Air Pollutants - HLVs (8 hr)</td>
</tr>
<tr>
<td>RTK - U.S. - Massachusetts - Right To Know List</td>
</tr>
<tr>
<td>U.S. - Michigan - Occupational Exposure Limits - TWAs</td>
</tr>
</tbody>
</table>
Lanthanum Strontium Manganite

Safety Data Sheet

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

15.3. Canadian Regulations

Lanthanum Strontium Manganite (66402-68-4)

WHMIS Classification | Class D Division 2 Subdivision B - Toxic material causing other toxic effects
                      | Class E - Corrosive Material

Ceramic materials and wares, chemicals (66402-68-4)

Listed on the Canadian DSL (Domestic Substances List)

WHMIS Classification | Class D Division 2 Subdivision B - Toxic material causing other toxic effects

Strontium oxide (SrO) (1314-11-0)

Listed on the Canadian DSL (Domestic Substances List)

WHMIS Classification | Class E - Corrosive Material

Lanthanum oxide (La2O3) (1312-81-8)

Listed on the Canadian DSL (Domestic Substances List)

WHMIS Classification | Uncontrolled Material

Manganese oxide (Mn3O4) (1317-35-7)

Listed on the Canadian DSL (Domestic Substances List)

WHMIS Classification | Uncontrolled Material

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the SDS contains all of the information required by CPR.

SECTION 16: OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

Revision Date : 10/01/2015
Other Information : This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200.

GHS Full Text Phrases:

<table>
<thead>
<tr>
<th>Eye Dam. 1</th>
<th>Serious eye damage/eye irritation Category 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin Corr. 1B</td>
<td>Skin corrosion/irritation Category 1B</td>
</tr>
<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>
</tbody>
</table>

Party Responsible for the Preparation of This Document

Nexceris, LLC. 404 Enterprise Dr. Lewis Center, OH 43035. T 614-842-6606

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

North America GHS US 2012 & WHMIS 2