Version No:1.0
Safety Data Sheet according to OSHA HazCom Standard (2012) requirements

Issue Date:05/09/2016 Initial Date: 05/09/2016 S.GHS.USA.EN

#### **SECTION 1 IDENTIFICATION**

Pr	ho	uct	Ide	ntif	ier

Product name	LANTHANUM STRONTIUM GALLIUM MAGNESIUM OXIDE
Synonyms	Gallium Lanthanum Magnesium Strontium Oxide, Lanthanum Gallate, Strontium and Magnesium doped, Lanthanum Strontium Gallate Magnesite, Strontium and Magnesium doped Lanthanum Gallate, LSGM
CAS number	66402-68-4*

#### Recommended use of the chemical and restrictions on use

Relevant identified uses Laboratory chemicals and manufacture of substances

#### Name, address, and telephone number of the chemical manufacturer, importer, or other responsible party

Registered company name	Nexceris, LLC
Address	404 Enterprise Dr., Lewis Center, OH 43035 United States
Telephone	614-842-6606
Fax	614-842-6607
Website	www.nexceris.com
Email	info@nexceris.com

#### Emergency phone number

Association / Organisation	Infotrac
Emergency telephone numbers	1-800-535-5053
Other emergency telephone numbers	Not Available

# **SECTION 2 HAZARD(S) IDENTIFICATION**

#### Classification of the substance or mixture

Classification Skin Corrosion/Irritation Category 2, Eye Irritation Category 2A, Specific target organ toxicity - single exposure Category 3 (respiratory tract irritation)

#### Label elements

GHS label elements



SIGNAL WORD

WARNING

#### Hazard statement(s)

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

## Hazard(s) not otherwise specified

Not Applicable

### Supplementary statement(s)

Not Applicable

#### Precautionary statement(s) Prevention

P271	Use only outdoors or in a well-ventilated area.

#### Precautionary statement(s) Response

P362 Take off contaminated clothing and wash before reuse.

#### Precautionary statement(s) Storage

P405 Store locked up.

#### Precautionary statement(s) Disposal

P501 Dispose of contents/container in accordance with local regulations.

## SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

#### Substances

CAS No	%[weight]	Name
1312-81-8	52-62	lanthanum oxide
12024-21-4	27-37	gallium oxide
1309-48-4	2-12	magnesium oxide
1314-11-0	1-10	strontium oxide

#### Mixtures

See section above for composition of Substances

#### **SECTION 4 FIRST-AID MEASURES**

#### Description of first aid measures

Eye Contact	If this product comes in contact with the eyes:  Wash out immediately with fresh running water.  Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.  Seek medical attention without delay; if pain persists or recurs seek medical attention.  Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.
Skin Contact	If skin contact occurs:  Immediately remove all contaminated clothing, including footwear.  Flush skin and hair with running water (and soap if available).  Seek medical attention in event of irritation.
Inhalation	<ul> <li>If fumes or combustion products are inhaled remove from contaminated area.</li> <li>Lay patient down. Keep warm and rested.</li> <li>Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.</li> <li>Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.</li> <li>Transport to hospital, or doctor, without delay.</li> </ul>
Ingestion	<ul> <li>If swallowed do NOT induce vomiting.</li> <li>If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.</li> <li>Observe the patient carefully.</li> <li>Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.</li> <li>Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.</li> <li>Seek medical advice.</li> </ul>

## Most important symptoms and effects, both acute and delayed

See Section 11

## Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

## **SECTION 5 FIRE-FIGHTING MEASURES**

#### Extinguishing media

- ▶ There is no restriction on the type of extinguisher which may be used.
- ▶ Use extinguishing media suitable for surrounding area.

## Special hazards arising from the substrate or mixture

		Fire Incompatibility
Charles and active assistances and accounting for fire lighters		

#### Special protective equipment and precautions for fire-fighters

Fire Fighting	▶ Alert Fire Brigade and tell them location and nature of hazard.
Fire/Explosion Hazard	Non combustible.  May emit poisonous fumes.May emit corrosive fumes.

# **SECTION 6 ACCIDENTAL RELEASE MEASURES**

Issue Date:05/09/2016

## Personal precautions, protective equipment and emergency procedures

Minor Spills	▶ Remove all ignition sources.
Major Spills	Moderate hazard.

Personal Protective Equipment advice is contained in Section 8 of the SDS.

## **SECTION 7 HANDLING AND STORAGE**

#### Precautions for safe handling

Safe handling	Avoid all personal contact, including inhalation.
Other information	▶ Store in original containers.

#### Conditions for safe storage, including any incompatibilities

Suitable container	Glass container is suitable for laboratory quantities     Polyethylene or polypropylene container.
Storage incompatibility	<ul> <li>Inorganic reducing agents react with oxidizing agents to generate heat and products that may be flammable, combustible, or otherwise reactive.</li> <li>Incidents involving interaction of active oxidants and reducing agents, either by design or accident, are usually very energetic and examples of so-called redox reactions.</li> <li>Avoid strong acids, acid chlorides, acid anhydrides and chloroformates.</li> </ul>

#### **SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION**

#### Control parameters

## OCCUPATIONAL EXPOSURE LIMITS (OEL)

#### INGREDIENT DATA

Source	Ingredient	Material name	TWA	STEL	Peak	Notes
US OSHA Permissible Exposure Levels (PELs) - Table Z1	magnesium oxide	Magnesium oxide fume	15 mg/m3	Not Available	Not Available	Total particulate
US ACGIH Threshold Limit Values (TLV)	magnesium oxide	Magnesium oxide	10 mg/m3	Not Available	Not Available	TLV® Basis: URT; metal fume fever
US NIOSH Recommended Exposure Limits (RELs)	magnesium oxide	Magnesia fume	Not Available	Not Available	Not Available	See Appendix D

# EMERGENCY LIMITS

Ingredient	Material name	TEEL-1	TEEL-2	TEEL-3
lanthanum oxide	Lanthanum oxide	4 mg/m3	44 mg/m3	270 mg/m3
gallium oxide	Gallium oxide	16 mg/m3	180 mg/m3	1100 mg/m3
magnesium oxide	Magnesium oxide	22 mg/m3	22 mg/m3	130 mg/m3

Ingredient	Original IDLH	Revised IDLH
lanthanum oxide	Not Available	Not Available
gallium oxide	Not Available	Not Available
magnesium oxide	N.E. / N.E.	750 mg/m3
strontium oxide	Not Available	Not Available

# **Exposure controls**

Appropriate engineering controls	Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard.
Personal protection	
Eye and face protection	▶ Safety glasses with side shields.
Skin protection	See Hand protection below
Hands/feet protection	The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Experience indicates that the following polymers are suitable as glove materials for protection against undissolved, dry solids, where abrasive particles are not present.
Body protection	See Other protection below
Other protection	▶ Overalls.
Thermal hazards	Not Available

#### Respiratory protection

Particulate.

Required Minimum Protection Factor	Half-Face Respirator	Full-Face Respirator	Powered Air Respirator
up to 10 x ES	P1 Air-line*	-	PAPR-P1
up to 50 x ES	Air-line**	P2	PAPR-P2
up to 100 x ES	-	P3	-
		Air-line*	-
100+ x ES	-	Air-line**	PAPR-P3

<sup>\* -</sup> Negative pressure demand \*\* - Continuous flow

A(All classes) = Organic vapours, B AUS or B1 = Acid gasses, B2 = Acid gas or hydrogen cyanide(HCN), B3 = Acid gas or hydrogen cyanide(HCN), E = Sulfurdioxide(SO2), G = Agricultural chemicals, K = Ammonia(NH3), Hg = Mercury, NO = Oxides of nitrogen, MB = Methyl bromide, AX = Low boiling point organiccompounds(below 65 degC)

## **SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES**

## Information on basic physical and chemical properties

Appearance	Gray		
Physical state	Divided Solid	Relative density (Water = 1)	Not Available
Odour	Not Available	Partition coefficient n-octanol / water	Not Available
Odour threshold	Not Available	Auto-ignition temperature (°C)	Not Available
pH (as supplied)	Not Available	Decomposition temperature	Not Available
Melting point / freezing point (°C)	Not Available	Viscosity (cSt)	Not Available
Initial boiling point and boiling range (°C)	Not Available	Molecular weight (g/mol)	Not Available
Flash point (°C)	Not Available	Taste	Not Available
Evaporation rate	Not Available	Explosive properties	Not Available
Flammability	Not Available	Oxidising properties	Not Available
Upper Explosive Limit (%)	Not Available	Surface Tension (dyn/cm or mN/m)	Not Applicable
Lower Explosive Limit (%)	Not Available	Volatile Component (%vol)	Not Available
Vapour pressure (kPa)	Not Available	Gas group	Not Available
Solubility in water (g/L)	Immiscible	pH as a solution (1%)	Not Available
Vapour density (Air = 1)	Not Available	VOC g/L	Not Available

## **SECTION 10 STABILITY AND REACTIVITY**

Reactivity	See section 7
Chemical stability	▶ Unstable in the presence of incompatible materials.
Possibility of hazardous reactions	See section 7
Conditions to avoid	See section 7
Incompatible materials	See section 7
Hazardous decomposition products	See section 5

#### **SECTION 11 TOXICOLOGICAL INFORMATION**

#### Information on toxicological effects

Inhaled	The material can cause respiratory irritation in some persons.  Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled.  Exposure to vapours of some rare earth salts can cause sensitivity to heat, itching, and increased sensitivity of smell and taste.
Ingestion	Accidental ingestion of the material may be damaging to the health of the individual.  Magnesiumsalts are generally absorbed so slowly that swallowing these cause few toxiceffects, with purging being the most significant.  Strontium salts induce vomiting and diarrhoea when swallowed in large quantity.  Lanthanide poisoning causes immediate defaecation, writhing, inco-ordination, laboured breathing, and inactivity.
Skin Contact	This material can cause inflammation of the skin on contact in some persons.  The material may accentuate any pre-existing dermatitis condition  Skin contact is not thought to have harmful health effects (as classified under EC Directives); the material may still produce health damage following entry through wounds, lesions or abrasions.  Open cuts, abraded or irritated skin should not be exposed to this material  Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects.
Eye	This material can cause eye irritation and damage in some persons.

#### Chronic

Long-term exposure to respiratory irritants may result in disease of the airways involving difficult breathing and related systemic problems. Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure.

Strontium accumulates in teeth and bone, especially in the growth plates of rapidly growing bone.

Long term exposure to high dust concentrations may cause changes in lung function i.e. pneumoconiosis, caused by particles less than 0.5 micron penetrating and remaining in the lung.

Lanthanum is one of the rare earth metals - light type (cerium family).

#### LANTHANUM STRONTIUM **GALLIUM MAGNESIUM** OXIDE

TOXICITY IRRITATION Not Available Not Available

# lanthanum oxide

TOXICITY IRRITATION Dermal (rabbit) LD50: >1087 mg/kg<sup>[1]</sup> Not Available Oral (rat) LD50: >8500 mg<sup>[2]</sup>

## gallium oxide

TOXICITY IRRITATION Oral (mouse) LD50: 10000  $mg/kg^{[2]}$ Not Available

## magnesium oxide

TOXICITY IRRITATION Not Available Nil reported

## strontium oxide

TOXICITY IRRITATION Not Available Not Available

#### Leaend:

1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2.\* Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances

#### LANTHANUM STRONTIUM **GALLIUM MAGNESIUM** OXIDE

Asthma-like symptoms may continue for months or even years after exposure to the material ceases.

Lanthanide poisoning causes immediate defaecation, writhing, inco-ordination, laboured breathing, and inactivity.

for typical lanthanides:

The symptoms of toxicity of the rare earth elements include writhing, ataxia, labored respiration, walking on the toes with arched back and sedation.

#### LANTHANUM OXIDE

Asthma-like symptoms may continue for months or even years after exposure to the material ceases.

Lanthanide poisoning causes immediate defaecation, writhing, inco-ordination, laboured breathing, and inactivity.

The material may be irritating to the eye, with prolonged contact causing inflammation.

No significant acute toxicological data identified in literature search.

#### **GALLIUM OXIDE**

No significant acute toxicological data identified in literature search. Substance has been investigated as a mutagen by DNA inhibition in human lynphocytes.

# MAGNESIUM OXIDE

The following information refers to contact allergens as a group and may not be specific to this product.

Asthma-like symptoms may continue for months or even years after exposure to the material ceases.

# STRONTIUM OXIDE

Asthma-like symptoms may continue for months or even years after exposure to the material ceases.

The material may be irritating to the eye, with prolonged contact causing inflammation.

The material may produce respiratory tract irritation, and result in damage to the lung including reduced lung function.

The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles,

scaling and thickening of the skin.

No significant acute toxicological data identified in literature search.

Acute Toxicity	0	Carcinogenicity	0
Skin Irritation/Corrosion	✓	Reproductivity	0
Serious Eye Damage/Irritation	<b>*</b>	STOT - Single Exposure	0
Respiratory or Skin sensitisation	0	STOT - Repeated Exposure	0
Mutagenicity	0	Aspiration Hazard	0

Legend:

🗶 – Data available but does not fill the criteria for classification

Data required to make classification available

Data Not Available to make classification

# **SECTION 12 ECOLOGICAL INFORMATION**

# **Toxicity**

Ingredient	Endpoint	Test Duration (hr)	Species	Value	Source
lanthanum oxide	EC50	72	Algae or other aquatic plants	13mg/L	2
lanthanum oxide	EC50	72	Algae or other aquatic plants	15.2mg/L	2

Page 6 of 7 Issue Date: 05/09/2016 Version No:1.0

#### LANTHANUM STRONTIUM GALLIUM MAGNESIUM OXIDE

lanthanum oxide	NOEC	196	Algae or other aquatic plants	>=0.00001mg/L	2
Legend:	Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 3. EPIWIN Suite V3.12 - Aquatic Toxicity Data (Estimated) 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data				

For Lanthanoids (Formerly Lanthanides: Synonym Rare Earth Metals and their Salts):

Environmental Fate: Rare earths, such as the lanthanoids, are relatively abundant in the crust of the Earth.

For strontium:

Environmental Fate: Strontiumpresent in the atmosphere is in the form of wet or dry aerosols.

**DO NOT** discharge into sewer or waterways.

#### Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
	No Data available for all ingredients	No Data available for all ingredients

#### Bioaccumulative potential

Ingredient	Bioaccumulation
	No Data available for all ingredients

#### Mobility in soil

Ingredient	Mobility
	No Data available for all ingredients

#### **SECTION 13 DISPOSAL CONSIDERATIONS**

#### Waste treatment methods

Product / Packaging disposal Legislation addressing waste disposal requirements may differ by country, state and/ or territory.

- DO NOT allow wash water from cleaning or process equipment to enter drains.
- ▶ Recycle wherever possible or consult manufacturer for recycling options.

#### **SECTION 14 TRANSPORT INFORMATION**

#### Labels Required

Marine Pollutant

Land transport (DOT): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

Air transport (ICAO-IATA / DGR): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

Sea transport (IMDG-Code / GGVSee): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

Transport in bulk according to Annex II of MARPOL and the IBC code

Not Applicable

# **SECTION 15 REGULATORY INFORMATION**

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

LANTHANUM OXIDE(1312-81-8) IS FOUND ON THE FOLLOWING REGULATORY LISTS

US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

GALLIUM OXIDE(12024-21-4) IS FOUND ON THE FOLLOWING REGULATORY LISTS

US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

#### MAGNESIUM OXIDE(1309-48-4) IS FOUND ON THE FOLLOWING REGULATORY LISTS

US - Alaska Limits for Air Contaminants

US - California Permissible Exposure Limits for Chemical Contaminants

US - Hawaii Air Contaminant Limits US - Idaho - Limits for Air Contaminants

US - Michigan Exposure Limits for Air Contaminants

US - Minnesota Permissible Exposure Limits (PELs)

US - Oregon Permissible Exposure Limits (Z-1)

US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants

US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants

STRONTIUM OXIDE(1314-11-0) IS FOUND ON THE FOLLOWING REGULATORY LISTS

US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

# Federal Regulations

Superfund Amendments and Reauthorization Act of 1986 (SARA)

US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air

US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants

US - Washington Permissible exposure limits of air contaminants

US ACGIH Threshold Limit Values (TLV) - Carcinogens

US ACGIH Threshold Limit Values (TLV)

#### SECTION 311/312 HAZARD CATEGORIES

Immediate (acute) health hazard	YES
Delayed (chronic) health hazard	NO
Fire hazard	NO
Pressure hazard	NO
Reactivity hazard	NO

#### US. EPA CERCLA HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES (40 CFR 302.4)

None Reported

## State Regulations

#### US. CALIFORNIA PROPOSITION 65

None Reported

National Inventory	Status	
Australia - AICS	Υ	
Canada - DSL	N (gallium oxide)	
Canada - NDSL	N (strontium oxide; lanthanum oxide; magnesium oxide)	
China - IECSC	Υ	
Europe - EINEC / ELINCS / NLP	Y	
Japan - ENCS	N (gallium oxide)	
Korea - KECI	Υ	
New Zealand - NZIoC	Υ	
Philippines - PICCS	N (strontium oxide; gallium oxide)	
USA - TSCA	Υ	
Legend:	Y = All ingredients are on the inventory N = Not determined or one or more ingredients are not on the inventory and are not exempt from listing(see specific ingredients in brackets)	

#### **SECTION 16 OTHER INFORMATION**

# Definitions and abbreviations

 $\mbox{PC-TWA: Permissible Concentration-Time Weighted Average} \label{eq:pc-twa}$ 

PC-STEL: Permissible Concentration-Short Term Exposure Limit

IARC: International Agency for Research on Cancer

ACGIH: American Conference of Governmental Industrial Hygienists

STEL: Short Term Exposure Limit

TEEL: Temporary Emergency Exposure Limit $_{\circ}$ 

IDLH: Immediately Dangerous to Life or Health Concentrations

OSF: Odour Safety Factor

NOAEL :No Observed Adverse Effect Level

LOAEL: Lowest Observed Adverse Effect Level

TLV: Threshold Limit Value LOD: Limit Of Detection

OTV: Odour Threshold Value

BCF: BioConcentration Factors

BEI: Biological Exposure Index