

# Safety Data Sheet

Issue Date: 02-Nov-2015

Revision Date: 13-Nov-2015

Version 1

## 1. IDENTIFICATION

### Product Identifier

**Product Name** NextCell

### Other means of identification

**SDS #** NT-014

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

**Recommended Use** Solid Oxide Fuel Cells.

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

#### Supplier Address

Nexceris, LLC  
404 Enterprise Dr.  
Lewis Center, OH 43035  
www.nexceris.com

### Emergency Telephone Number

**Company Phone Number** Non-emergency calls/questions: 1-614-842-6606  
Fax: 1-614-842-6607  
**Emergency Telephone (24 hr)** INFOTRAC 1-352-323-3500 (International)  
1-800-535-5053 (North America)

## 2. HAZARDS IDENTIFICATION

**Appearance** According to product specification

**Physical State** Solid

### Classification

Acute toxicity - Inhalation (Vapors)	Category 4
Skin sensitization	Category 1
Carcinogenicity	Category 1A
Specific target organ toxicity (repeated exposure)	Category 1

### Hazards Not Otherwise Classified (HNOC)

May be harmful if swallowed

### Signal Word

**Danger**

### Hazard Statements

Harmful if inhaled  
May cause an allergic skin reaction  
May cause cancer  
Causes damage to organs through prolonged or repeated exposure



**Precautionary Statements - Prevention**

Obtain special instructions before use  
 Do not handle until all safety precautions have been read and understood  
 Use personal protective equipment as required  
 Use only outdoors or in a well-ventilated area  
 Contaminated work clothing must not be allowed out of the workplace  
 Wear protective gloves  
 Do not breathe dust/fume/gas/mist/vapors/spray  
 Wash face, hands and any exposed skin thoroughly after handling  
 Do not eat, drink or smoke when using this product

**Precautionary Statements - Response**

If exposed or concerned: Get medical advice/attention  
 IF ON SKIN: Wash with plenty of soap and water  
 If skin irritation or rash occurs: Get medical advice/attention  
 Wash contaminated clothing before reuse  
 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing  
 Call a poison center or doctor/physician if you feel unwell

**Precautionary Statements - Storage**

Store locked up  
 Store in a well-ventilated place. Keep container tightly closed

**Precautionary Statements - Disposal**

Dispose of contents/container to an approved waste disposal plant

**Other Hazards**

Harmful to aquatic life with long lasting effects

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS No	Weight-%
Zirconium Oxide	1314-23-4	60-90
Nickel Oxide	1313-99-1	1-20
Scandium Oxide	12060-08-1	0-10
Lanthanum Oxide	1312-81-8	0.5-15
Cerium Oxide	1306-38-3	0.1-12
Manganese Oxide	1317-35-7	0-10
Hafnium Oxide	12055-23-1	1-3
Strontium Oxide	1314-11-0	0.1-5
Aluminum Oxide	1344-28-1	0-1
Gadolinium (III) Oxide	12064-62-9	0.1-2
Cobalt Oxide	1308-06-1	0.01-2
Yttrium Oxide	1314-36-9	0-15
Samarium Oxide	12060-58-1	0.1-1
Iron Oxide	1332-37-2	0-10

\*\*If Chemical Name/CAS No is "proprietary" and/or Weight-% is listed as a range, the specific chemical identity and/or percentage of composition has been withheld as a trade secret.\*\*

### 4. FIRST-AID MEASURES

**First Aid Measures****General Advice**

Provide this SDS to medical personnel for treatment.

<b>Eye Contact</b>	Rinse thoroughly with plenty of water for at least 15 minutes, lifting lower and upper eyelids. Consult a physician.
<b>Skin Contact</b>	IF ON SKIN: Wash with plenty of soap and water. If skin irritation or rash occurs: Get medical advice/attention. Wash contaminated clothing before reuse.
<b>Inhalation</b>	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a poison center or doctor/physician if you feel unwell.
<b>Ingestion</b>	Clean mouth with water and drink afterwards plenty of water.

**Most important symptoms and effects**

<b>Symptoms</b>	Toxic if inhaled. May cause an allergic skin reaction. Causes damage to organs through prolonged or repeated exposure. May be harmful if swallowed.
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**Indication of any immediate medical attention and special treatment needed**

<b>Notes to Physician</b>	Treat symptomatically.
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**5. FIRE-FIGHTING MEASURES****Suitable Extinguishing Media**

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

**Unsuitable Extinguishing Media** Not determined.

**Specific Hazards Arising from the Chemical**

Not determined.

**Protective equipment and precautions for firefighters**

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

**6. ACCIDENTAL RELEASE MEASURES****Personal precautions, protective equipment and emergency procedures**

<b>Personal Precautions</b>	Use personal protective equipment as required.
<b>Environmental Precautions</b>	See Section 12 for additional Ecological Information.

**Methods and material for containment and cleaning up**

<b>Methods for Containment</b>	Prevent further leakage or spillage if safe to do so.
<b>Methods for Clean-Up</b>	Keep in suitable, closed containers for disposal.

**7. HANDLING AND STORAGE****Precautions for safe handling**

<b>Advice on Safe Handling</b>	Handle in accordance with good industrial hygiene and safety practice. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use personal protective equipment as required. Use only outdoors or in a well-ventilated area. Contaminated work clothing must not be allowed out of the workplace. Wear protective gloves. Do not breathe dust/fume/gas/mist/vapors/spray. Wash face, hands, and any exposed skin thoroughly after handling. Do not eat, drink or smoke when using this product.
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**Conditions for safe storage, including any incompatibilities**

**Storage Conditions** Keep container tightly closed and store in a cool, dry and well-ventilated place. Store locked up.

**Incompatible Materials** None known based on information supplied.

**8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

**Exposure Guidelines**

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Zirconium Oxide 1314-23-4	STEL: 10 mg/m <sup>3</sup> Zr TWA: 5 mg/m <sup>3</sup> Zr	TWA: 5 mg/m <sup>3</sup> Zr (vacated) TWA: 5 mg/m <sup>3</sup> Zr (vacated) STEL: 10 mg/m <sup>3</sup> Zr	IDLH: 25 mg/m <sup>3</sup> Zr TWA: 5 mg/m <sup>3</sup> except Zirconium tetrachloride Zr STEL: 10 mg/m <sup>3</sup> Zr
Nickel Oxide 1313-99-1	TWA: 0.2 mg/m <sup>3</sup> Ni inhalable fraction	TWA: 1 mg/m <sup>3</sup> Ni (vacated) TWA: 1 mg/m <sup>3</sup> Ni	IDLH: 10 mg/m <sup>3</sup> Ni TWA: 0.015 mg/m <sup>3</sup> except Nickel carbonyl Ni
Manganese Oxide 1317-35-7	TWA: 0.02 mg/m <sup>3</sup> Mn TWA: 0.1 mg/m <sup>3</sup> Mn	(vacated) TWA: 1 mg/m <sup>3</sup> Mn (vacated) Ceiling: 5 mg/m <sup>3</sup> Ceiling: 5 mg/m <sup>3</sup> Mn	IDLH: 500 mg/m <sup>3</sup> Mn TWA: 1 mg/m <sup>3</sup> Mn STEL: 3 mg/m <sup>3</sup> Mn
Hafnium Oxide 12055-23-1	TWA: 0.5 mg/m <sup>3</sup> Hf	-	IDLH: 50 mg/m <sup>3</sup> Hf TWA: 0.5 mg/m <sup>3</sup> Hf
Aluminum Oxide 1344-28-1	TWA: 1 mg/m <sup>3</sup> respirable fraction	TWA: 15 mg/m <sup>3</sup> total dust TWA: 5 mg/m <sup>3</sup> respirable fraction (vacated) TWA: 10 mg/m <sup>3</sup> total dust (vacated) TWA: 5 mg/m <sup>3</sup> respirable fraction	-
Cobalt Oxide 1308-06-1	TWA: 0.02 mg/m <sup>3</sup> Co	-	-
Yttrium Oxide 1314-36-9	TWA: 1 mg/m <sup>3</sup> Y	-	IDLH: 500 mg/m <sup>3</sup> Y TWA: 1 mg/m <sup>3</sup> Y

**Appropriate engineering controls**

**Engineering Controls** Apply technical measures to comply with the occupational exposure limits.

**Individual protection measures, such as personal protective equipment**

**Eye/Face Protection** Refer to 29 CFR 1910.133 for eye and face protection regulations.

**Skin and Body Protection** Refer to 29 CFR 1910.138 for appropriate skin and body protection.

**Respiratory Protection** Refer to 29 CFR 1910.134 for respiratory protection requirements.

**General Hygiene Considerations** Handle in accordance with good industrial hygiene and safety practice.

**9. PHYSICAL AND CHEMICAL PROPERTIES**

**Information on basic physical and chemical properties**

<b>Physical State</b>	Solid	<b>Odor</b>	Not determined
<b>Appearance</b>	According to product specification	<b>Odor Threshold</b>	Not determined
<b>Color</b>	Not determined		

<b>Property</b>	<b>Values</b>	<b>Remarks • Method</b>
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<b>pH</b>	Not determined
<b>Melting Point/Freezing Point</b>	Not determined
<b>Boiling Point/Boiling Range</b>	Not determined
<b>Flash Point</b>	Not determined
<b>Evaporation Rate</b>	Not determined
<b>Flammability (Solid, Gas)</b>	Not determined
<b>Upper Flammability Limits</b>	Not determined
<b>Lower Flammability Limit</b>	Not determined
<b>Vapor Pressure</b>	Not determined
<b>Vapor Density</b>	Not determined
<b>Specific Gravity</b>	Not determined
<b>Water Solubility</b>	Not determined
<b>Solubility in other solvents</b>	Not determined
<b>Partition Coefficient</b>	Not determined
<b>Auto-ignition Temperature</b>	Not determined
<b>Decomposition Temperature</b>	Not determined
<b>Kinematic Viscosity</b>	Not determined
<b>Dynamic Viscosity</b>	Not determined
<b>Explosive Properties</b>	Not determined
<b>Oxidizing Properties</b>	Not determined

## 10. STABILITY AND REACTIVITY

### Reactivity

Not reactive under normal conditions.

### Chemical Stability

Stable under recommended storage conditions.

### Possibility of Hazardous Reactions

None under normal processing.

### Conditions to Avoid

Keep out of reach of children.

### Incompatible Materials

None known based on information supplied.

### Hazardous Decomposition Products

None known based on information supplied.

## 11. TOXICOLOGICAL INFORMATION

### Information on likely routes of exposure

#### Product Information

<b>Eye Contact</b>	Avoid contact with eyes.
<b>Skin Contact</b>	May cause an allergic skin reaction.
<b>Inhalation</b>	Harmful if inhaled.
<b>Ingestion</b>	May be harmful if swallowed.

### Component Information

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Nickel Oxide 1313-99-1	> 5000 mg/kg ( Rat )	-	-
Lanthanum Oxide 1312-81-8	> 8500 mg/kg ( Rat )	-	-
Cerium Oxide 1306-38-3	> 1000 mg/kg ( Rat )	> 2000 mg/kg ( Rat )	> 2.01 mg/L ( Rat ) 4 h
Aluminum Oxide 1344-28-1	> 5000 mg/kg ( Rat )	-	-
Gadolinium (III) Oxide 12064-62-9	> 5 g/kg ( Rat )	-	-
Cobalt Oxide 1308-06-1	> 5000 mg/kg ( Rat )	> 2000 mg/kg ( Rat )	> 4.83 mg/L ( Rat ) 4 h
Samarium Oxide 12060-58-1	> 5 g/kg ( Rat )	-	-

### Information on physical, chemical and toxicological effects

#### Symptoms

Please see section 4 of this SDS for symptoms.

### Delayed and immediate effects as well as chronic effects from short and long-term exposure

#### Carcinogenicity

The table below indicates whether each agency has listed any ingredient as a carcinogen. However, the product as a whole has not been tested.

Chemical Name	ACGIH	IARC	NTP	OSHA
Nickel Oxide 1313-99-1	A1	Group 1	Known	X
Cobalt Oxide 1308-06-1	A3	Group 2B		X

#### Legend

##### **ACGIH (American Conference of Governmental Industrial Hygienists)**

A1 - Known Human Carcinogen

A3 - Animal Carcinogen

##### **IARC (International Agency for Research on Cancer)**

Group 1 - Carcinogenic to Humans

Group 2B - Possibly Carcinogenic to Humans

##### **NTP (National Toxicology Program)**

Known - Known Carcinogen

##### **OSHA (Occupational Safety and Health Administration of the US Department of Labor)**

X - Present

#### STOT - repeated exposure

Causes damage to organs through prolonged or repeated exposure.

### Numerical measures of toxicity

Not determined

## 12. ECOLOGICAL INFORMATION

### Ecotoxicity

Harmful to aquatic life with long lasting effects.

### Component Information

Chemical Name	Algae/aquatic plants	Fish	Toxicity to microorganisms	Crustacea
Nickel Oxide 1313-99-1	127.3: 72 h Pseudokirchneriella subcapitata mg/L EC50	100: 96 h Brachydanio rerio mg/L LC50 static		100: 48 h Daphnia magna mg/L EC50
Cobalt Oxide 1308-06-1	88: 72 h Pseudokirchneriella subcapitata mg/L EC50	136: 96 h Brachydanio rerio mg/L LC50 static		136: 48 h Daphnia magna mg/L EC50

### Persistence/Degradability

Not determined.

**Bioaccumulation**

Not determined.

**Mobility**

Not determined

**Other Adverse Effects**

Not determined

**13. DISPOSAL CONSIDERATIONS**

**Waste Treatment Methods**

**Disposal of Wastes**

Disposal should be in accordance with applicable regional, national and local laws and regulations.

**Contaminated Packaging**

Disposal should be in accordance with applicable regional, national and local laws and regulations.

**California Hazardous Waste Status**

Chemical Name	California Hazardous Waste Status
Cobalt Oxide 1308-06-1	Toxic

**14. TRANSPORT INFORMATION**

**Note**

Please see current shipping paper for most up to date shipping information, including exemptions and special circumstances.

**DOT**

Not regulated

**IATA**

Not regulated

**IMDG**

**Marine Pollutant**

This material may meet the definition of a marine pollutant

**15. REGULATORY INFORMATION**

**International Inventories**

Chemical Name	TSCA	DSL	NDSL	EINECS	ELINCS	ENCS	IECSC	KECL	PICCS	AICS
Zirconium Oxide	Present	X		Present		Present	X	Present	X	X
Nickel Oxide	Present	X		Present		Present	X	Present	X	X
Scandium Oxide	Present	X		Present			X	Present		X
Lanthanum Oxide	Present	X		Present		Present	X	Present	X	X
Cerium Oxide	Present	X		Present		Present	X	Present	X	X
Manganese Oxide	Present	X		Present		Present	X	Present	X	X
Hafnium Oxide	Present	X		Present		Present	X	Present		
Strontium Oxide	Present	X		Present		Present	X	Present		X
Aluminum Oxide	Present	X		Present		Present	X	Present	X	X
Gadolinium (III) Oxide	Present	X		Present		Present	X	Present	X	X
Cobalt Oxide	Present	X		Present		Present	X	Present		X
Yttrium Oxide	Present	X		Present		Present	X	Present	X	X
Samarium Oxide	Present	X		Present		Present	X	Present		X

Iron Oxide	Present	X		Present		Present	X	Present	X	X
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**Legend:**

- TSCA - United States Toxic Substances Control Act Section 8(b) Inventory*
- DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List*
- EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances*
- ENCS - Japan Existing and New Chemical Substances*
- IECSC - China Inventory of Existing Chemical Substances*
- KECL - Korean Existing and Evaluated Chemical Substances*
- PICCS - Philippines Inventory of Chemicals and Chemical Substances*
- AICS - Australian Inventory of Chemical Substances*

**US Federal Regulations**

**CERCLA**

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355).

**SARA 313**

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

Chemical Name	CAS No	Weight-%	SARA 313 - Threshold Values %
Nickel Oxide - 1313-99-1	1313-99-1	9.4	0.1
Manganese Oxide - 1317-35-7	1317-35-7	3.6	1.0
Aluminum Oxide - 1344-28-1	1344-28-1	0-1	1.0
Cobalt Oxide - 1308-06-1	1308-06-1	0.4	0.1

**CWA (Clean Water Act)**

This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

Chemical Name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Nickel Oxide		X		

**US State Regulations**

**California Proposition 65**

This product contains the following Proposition 65 chemicals.

Chemical Name	California Proposition 65
Nickel Oxide - 1313-99-1	Carcinogen

**U.S. State Right-to-Know Regulations**

Chemical Name	New Jersey	Massachusetts	Pennsylvania
Nickel Oxide 1313-99-1	X	X	X
Manganese Oxide 1317-35-7	X	X	X
Aluminum Oxide 1344-28-1	X	X	X
Cobalt Oxide 1308-06-1	X		X

**16. OTHER INFORMATION**

<b><u>NFPA</u></b>	<b>Health Hazards</b> Not determined	<b>Flammability</b> Not determined	<b>Instability</b> Not determined	<b>Special Hazards</b> Not determined
<b><u>HMIS</u></b>	<b>Health Hazards</b> Not determined	<b>Flammability</b> Not determined	<b>Physical Hazards</b> Not determined	<b>Personal Protection</b> Not determined

**Issue Date:** 02-Nov-2015  
**Revision Date:** 13-Nov-2015  
**Revision Note:** New format

**Disclaimer**

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

**End of Safety Data Sheet**