

Safety Data Sheet

Issue Date: 04-Aug-2015

Revision Date: 01-Oct-2015

Version 1

1. IDENTIFICATION

Product Identifier

Product Name Nickel Oxide - YSZ

Other means of identification

SDS # NT-009

Synonyms NIYSZ; Nickel Oxide - Yttria Stabilized Zirconia.

Recommended use of the chemical and restrictions on use

Recommended Use Laboratory chemicals and Manufacture of substances.

Details of the supplier of the safety data sheet

Supplier Address

Fuel Cell Store
1902 Pinon Drive, Unit B
College Station, Texas, USA 77845
www.fuelcellstore.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 Green/gray solid

Physical State Solid

Classification

| | |
|--|-------------|
| 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

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
Contaminated work clothing should 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
Wash contaminated clothing before reuse
If skin irritation or rash occurs: Get medical advice/attention

Precautionary Statements - Storage

Store locked up

Precautionary Statements - Disposal

Dispose of contents/container to an approved waste disposal plant

Other Hazards

Harmful to aquatic life with long lasting effects

Unknown Acute Toxicity

35% of the mixture consists of ingredient(s) of unknown toxicity

3. COMPOSITION/INFORMATION ON INGREDIENTS**Synonyms**

NIYSZ Nickel Oxide - Yttria Stabilized Zirconia.

| Chemical Name | CAS No | Weight-% |
|----------------------------|-------------|----------|
| Nickel Oxide | 1313-99-1 | 50-80 |
| Yttria Stabilized Zirconia | 114168-16-0 | 20-50 |

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**

If exposed or concerned: Get medical advice/attention.

Eye Contact

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Remove contact lenses, if present and easy to do. Continue rinsing. Seek medical attention if irritation develops.

Skin Contact

IF ON SKIN: Wash with plenty of soap and water. Remove and wash contaminated clothing before reuse. If skin irritation or rash occurs: Get medical advice/attention.

Inhalation

IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Seek medical attention for further treatment.

Ingestion

IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. Seek medical attention if symptoms develop.

Most important symptoms and effects

| | |
|-----------------|---|
| Symptoms | May cause an allergic skin reaction. May be harmful if swallowed. May cause gastrointestinal disturbance. |
|-----------------|---|

Indication of any immediate medical attention and special treatment needed

| | |
|---------------------------|------------------------|
| Notes to Physician | Treat symptomatically. |
|---------------------------|------------------------|

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**

| | |
|----------------------------------|--|
| Personal Precautions | Use personal protective equipment as required. Avoid creating dust. |
| Environmental Precautions | Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information. See Section 13: DISPOSAL CONSIDERATIONS. |

Methods and material for containment and cleaning up

| | |
|--------------------------------|---|
| Methods for Containment | Prevent further leakage or spillage if safe to do so. |
| Methods for Clean-Up | Avoid creating dust. Sweep up dry spills and place in a container for recovery or disposal. |

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

| | |
|--------------------------------|---|
| Advice on Safe Handling | Handle in accordance with good industrial hygiene and safety practice. Use personal protective equipment as required. Avoid contact with skin, eyes or clothing. Avoid generation of dust. Wash face, hands and any exposed skin thoroughly after handling. Wash contaminated clothing before reuse. Do not breathe dust/fume/gas/mist/vapors/spray. Do not eat, drink or smoke when using this product. Contaminated work clothing should not be allowed out of the workplace. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. |
|--------------------------------|---|

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 |
|---------------------------|--|--|---|
| Nickel Oxide 1313-99-1 | TWA: 0.2 mg/m ³ Ni inhalable fraction | TWA: 1 mg/m ³ Ni (vacated) TWA: 1 mg/m ³ Ni | IDLH: 10 mg/m ³ Ni TWA: 0.015 mg/m ³ except Nickel carbonyl Ni |

Appropriate engineering controls

Engineering Controls Apply technical measures to comply with the occupational exposure limits. Eyewash stations. Showers.

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 Wear suitable gloves. Wear suitable protective clothing. Refer to 29 CFR 1910.138 for appropriate skin and body protection.

Respiratory Protection Ensure adequate ventilation, especially in confined areas. In case of inadequate ventilation wear 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. Take off all contaminated clothing and wash it before reuse. Contaminated work clothing should not be allowed out of the workplace.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

| | | | |
|----------------|------------------|----------------|----------------|
| Physical State | Solid | Odor | Not determined |
| Appearance | Green/gray solid | Odor Threshold | Not determined |
| Color | Green/gray | | |

| <u>Property</u> | <u>Values</u> | <u>Remarks • Method</u> |
|------------------------------|-------------------------------|-------------------------|
| pH | Not determined | |
| Melting Point/Freezing Point | Not determined | |
| Boiling Point/Boiling Range | Not determined | |
| Flash Point | Not determined | |
| Evaporation Rate | Not determined | |
| Flammability (Solid, Gas) | Not determined | |
| Upper Flammability Limits | Not determined | |
| Lower Flammability Limit | Not determined | |
| Vapor Pressure | Not determined | |
| Vapor Density | Not determined | |
| Specific Gravity | Not determined | |
| Water Solubility | Not miscible Difficult to mix | |
| Solubility in other solvents | Not determined | |
| Partition Coefficient | Not determined | |
| Auto-ignition Temperature | Not self-igniting | |
| Decomposition Temperature | Not determined | |
| Kinematic Viscosity | Not determined | |
| Dynamic Viscosity | Not determined | |
| Explosive Properties | Not determined | |
| Oxidizing Properties | 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. Avoid generation of dust. See Sec. 7 Handling & Storage.

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**

| | |
|---------------------|------------------------------|
| Eye Contact | Avoid contact with eyes. |
| Skin Contact | Avoid contact with skin. |
| Inhalation | Avoid inhalation of dust. |
| Ingestion | May be harmful if swallowed. |

Component Information

| Chemical Name | Oral LD50 | Dermal LD50 | Inhalation LC50 |
|---------------------------|----------------------|-------------|-----------------|
| Nickel Oxide 1313-99-1 | > 5000 mg/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

| | |
|------------------------|--------------------------------------|
| Sensitization | May cause an allergic skin reaction. |
| Carcinogenicity | May cause cancer. |

| Chemical Name | ACGIH | IARC | NTP | OSHA |
|---------------------------|-------|---------|-------|------|
| Nickel Oxide 1313-99-1 | A1 | Group 1 | Known | X |

Legend

ACGIH (American Conference of Governmental Industrial Hygienists)

A1 - Known Human Carcinogen

IARC (International Agency for Research on Cancer)

Group 1 - 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

Unknown Acute Toxicity

35% of the mixture consists of ingredient(s) of unknown toxicity.

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 |

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.

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 |
|---------------|---------|-----|------|---------|--------|---------|-------|---------|-------|------|
| Nickel Oxide | Present | X | | Present | | Present | X | Present | X | X |

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

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 | 50-80 | 0.1 |

CWA (Clean Water Act)

| 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 |

16. OTHER INFORMATION**NFPA****Health Hazards**

Not determined

Flammability

Not determined

Instability

Not determined

Special Hazards

Not determined

HMIS**Health Hazards**

Not determined

Flammability

Not determined

Physical Hazards

Not determined

Personal Protection

Not determined

Issue Date: 04-Aug-2015**Revision Date:** 01-Oct-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