

## SECTION 1: PRODUCT & COMPANY IDENTIFICATION

### 1.1 Product Identifiers

Product Name: NANOMYTE® BE-56E

Product Description: Lithium Manganese Nickel Cobalt Oxide (NMC811) electrode sheet

### 1.2 Relevant Identified Uses of the Substance or Mixture and Uses Advised Against

Identified Uses: Laboratory chemicals, research & development, lithium-ion batteries

### 1.3 Details of the Supplier of the Safety Data Sheet

Company: NEI Corporation

Address: 400 Apgar Drive, Unit E | Somerset, NJ 08873 – USA

Phone: +1 (732) 868-3141

Fax: +1 (732) 868-3143

Email: productinfo@neicorporation.com

### 1.4 Emergency Telephone Number

Manufacturer: +1 (732) 868-3142 (9am to 6pm EST / UTC -0500)

U.S. Poison Control Center: +1-800-222-1222

## SECTION 2: HAZARDS IDENTIFICATION

### 2.1 Classification of the Substance or Mixture

#### GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Acute toxicity, inhalation (Category 2), H330

Carcinogenicity (Category 1B), H350

Specific Target Organ Toxicity - repeated exposure (STOT-RE, Category 1), H372

Acute aquatic hazard (Category 3), H402

Chronic aquatic hazard (Category 3), H412

### 2.2 GHS Label elements, including precautionary statements

Pictogram(s):  

Signal Word: Danger

#### Hazard Statement(s):

H330 Fatal if inhaled

H350 May cause cancer by inhalation

H372 Causes damage to organs (Lung) through prolonged or repeated exposure (inhalation).

H402 Harmful to aquatic life

H412 Harmful to aquatic life with long-lasting effects

#### Precautionary Statement(s):

P202 Do not handle until all safety precautions have been read and understood.

P260 Do not breathe dust/gas/mist/vapors.

P273 Avoid release to the environment.

P280 Wear protective gloves / protective clothing / eye protection / face protection.

P284 In case of inadequate ventilation wear respiratory protection.

P304 + P340 + P310 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER or doctor/physician.

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.

P501 Dispose of contents/ container to an approved waste disposal plant.

### 2.3 Hazards not otherwise classified (HNOC) or not covered by GHS

Contains a combustible dust [carbon black]

## SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

### 3.1 Substances

Component Name	Synonyms	Formula	CAS #	Weight %
Cobalt Lithium Manganese Nickel Oxide	NMC811	LiNi <sub>0.8</sub> Mn <sub>0.1</sub> Co <sub>0.1</sub> O <sub>2</sub>	182442-95-1	90%
<b>Hazards:</b> <i>Acute tox., inhalation (Cat 2, H330); Carcinogenicity (Cat 1B, H350); STOT-RE (Cat 1, H372); Acute Aq. Haz. (Cat. 3, H402); Chronic Aq. Haz. (Cat. 3, H412)</i>				
Poly(vinylidene fluoride)	PVDF	(C <sub>2</sub> H <sub>2</sub> F <sub>2</sub> ) <sub>x</sub>	24937-79-9	5%
<b>Hazards:</b> <i>Not a hazardous substance or mixture</i>				
Carbon Black	Carbon	C	1333-86-4	5%
<b>Hazards:</b> <i>Carcinogenicity (Cat. 2, H351)</i>				
Aluminum Foil Sheet	Aluminium	Al	7429-90-5	(substrate)
<b>Hazards:</b> <i>Not a hazardous substance or mixture</i>				

## SECTION 4: FIRST AID MEASURES

### 4.1 Description of First Aid Measures

#### General Advice:

Move out of dangerous area. Consult a physician. Show this safety data sheet to the doctor in attendance. First aid personnel should pay attention to their own safety. If the patient is likely to become unconscious, place and transport in stable sideways position (recovery position). Immediately remove contaminated clothing.

#### After Inhalation:

Keep patient calm, remove to fresh air. If breathing difficulties develop, aid in breathing and seek immediate medical attention.

#### After Skin Contact:

Wash with soap and copious amounts of water. Seek medical attention if irritation develops.

#### After Eye Contact:

Flush eyes with copious amounts of water for at least 15 minutes. Seek medical attention if irritation develops.

#### After Swallowing:

Immediately rinse mouth and then drink 200-300 ml of water. If vomiting occurs, keep head lower than hips to prevent aspiration. Seek immediate medical attention.

### 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 Section 11.

### 4.3 Indication of Any Immediate Medical Attention and Special Treatment Needed

Treat according to symptoms (decontamination, vital functions), no known specific antidote.

## SECTION 5: FIREFIGHTING MEASURES

### 5.1 Suitable Extinguishing Media

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide

### 5.2 Hazardous Combustion Products

Nickel Oxides, Lithium Oxides, Cobalt Oxides, Manganese Oxides, Carbon Oxides, Hydrogen Fluoride

### 5.3 Advice for Firefighters

Firefighters should be equipped with self-contained breathing apparatus and turn-out gear.

### 5.4 Other Information

No Data Available

## SECTION 6: ACCIDENTAL RELEASE MEASURES

### 6.1 Personal Precautions, Protective Equipment, and Emergency Procedures

Use personal protective equipment. Avoid dust formation. Do not breathe dust. Breathing protection required. Avoid contact with the skin, eyes and clothing. Use personal protective clothing.

## 6.2 Environmental Precautions

Do not discharge into drains/surface waters/groundwater. Contain contaminated water/firefighting water.

## 6.3 Methods and Materials for Containment and Cleaning Up

Contain spillage. Sweep/shovel up. Collect waste in suitable containers, which can be labeled and sealed. Avoid raising dust. Do not discharge into drains/surface waters/groundwater.

## 6.4 Reference to Other Sections

For personal protection, see section 8; for disposal see Section 13.

## SECTION 7: HANDLING AND STORAGE

### 7.1 Precautions for Safe Handling

Keep container tightly closed. Avoid contact with the skin, eyes and clothing. Avoid inhalation of dusts. Ensure adequate ventilation. Wear appropriate respiratory protection. Wear suitable protective clothing and gloves.

### 7.2 Conditions for Safe Storage (including any incompatibilities)

Keep container tightly sealed in a dry and well-ventilated place. Keep in a dry place (avoid moisture).

### 7.3 Specific End Uses

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.

## SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

### 8.1 Control Parameters

Components with workplace control parameters:

Component	CAS #	Value	Control Parameters	Basis
<b>NMC811</b>	182442-95-1	CLV	5 mg/m <sup>3</sup>	OSHA Permissible Exposure Limit (PEL)
		TWA	0.02 mg/m <sup>3</sup>	ACGIH Threshold Limit Value (TLV)
Remarks	<i>Pulmonary function; Asthma; Myocardial effects; Confirmed animal carcinogen with unknown relevance to humans</i>			
<b>Carbon Black</b>	1333-86-4	TWA	3.5 mg/m <sup>3</sup>	OSHA Permissible Exposure Limit (PEL)
		TWA	3.5 mg/m <sup>3</sup>	NIOSH Recommended Exposure Limit (REL)
		TWA	0.1 mg PAHs/m <sup>3</sup>	NIOSH Recommended Exposure Limit (REL) (carbon black in the presence of PAHs)
		TWA	3.5 mg/m <sup>3</sup>	ACGIH Threshold Limit Value (TLV) (inhalable particulate matter)
Remarks	<i>Bronchitis; Confirmed animal carcinogen with unknown relevance to humans; Not classifiable as a human carcinogen</i>			

### 8.2 Exposure Controls

#### Appropriate Engineering Controls

Handle in accordance with good industrial hygiene and safety practice. Keep away from food and beverages. Remove all soiled and contaminated clothing immediately. Wash hands after use.

#### 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.

Recommendation: Nitrile rubber, 0.11mm thick (full or splash contact).

Recommendations are advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use. It should not be construed as offering an approval for any specific use scenario.

Body Protection:

Complete suit protecting against chemicals. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory Protection:

This product contains a substance regulated by the EPA under a Significant New Use Rule (SNUR) 40 CFR 721.10201. Follow all applicable respiratory provisions.

Where risk assessment shows air-purifying respirators are appropriate, use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. 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.

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**SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES**

**9.1 Information on Basic Physical and Chemical Properties**

Physical State:	Solid (cast electrode sheet)
Color:	Black
Odor:	Odorless
Odor Threshold:	No Data Available
pH:	No Data Available
Melting Point / Range:	No Data Available
Boiling Point / Range:	No Data Available
Flash Point:	No Data Available
Evaporation Rate:	No Data Available
Flammability:	No Data Available
Upper Explosion Limit:	No Data Available
Lower Explosion Limit:	No Data Available
Vapor Pressure:	No Data Available
Vapor Density:	No Data Available
Relative Density:	No Data Available
Water Solubility:	No Data Available
Partition Coefficient:	No Data Available
Auto-ignition Temperature:	No Data Available
Decomposition Temperature:	No Data Available
Viscosity:	No Data Available

**9.2 Other Safety Information**

No Data Available

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**SECTION 10: STABILITY AND REACTIVITY**

**10.1 Reactivity**

No hazardous reactions if stored and handled as prescribed/indicated.

**10.2 Chemical Stability**

Stable under recommended storage conditions.

**10.3 Possibility of Hazardous Reactions**

The product is chemically stable. No hazardous reactions when stored and handled according to instructions.

**10.4 Conditions to Avoid**

Avoid dust formation and exposure to moisture.

**10.5 Incompatible Materials**

Strong acids, strong alkalis, strong oxidizing agents, strong reducing agents

## 10.6 Hazardous Decomposition Products

Possible thermal decomposition products: cobalt oxides, metallic oxides

## SECTION 11: TOXICOLOGICAL INFORMATION

### 11.1 Information on Toxicological Effects

#### Acute Toxicity

High toxicity after short-term inhalation. Virtually nontoxic after a single skin contact. Virtually nontoxic after a single ingestion. May be harmful if swallowed in large quantities. May cause pain, nausea, vomiting and diarrhea.

Component	Oral LD50	Dermal LD50	Inhalation LC50
NMC811	> 2,000 mg/kg (Rat)	> 2,000 mg/kg (Rat)	0.05 mg/l (Rat, 6 hrs)
Carbon Black	> 8,000 mg/kg (Rat)	No data available	No data available
Poly(vinylidene fluoride)	No data available	No data available	No data available

#### Skin corrosion/irritation

Contact with powders or dusts may irritate skin

#### Serious eye damage/eye irritation

Contact with powders or dusts may irritate the eyes

#### Respiratory or skin sensitization

Contact with powders may irritate respiratory tract. Skin sensitizing effects were not observed in animal studies.

#### Germ cell mutagenicity

No Data Available

#### Carcinogenicity

May cause cancer. The product has not been tested. The statement has been derived from the properties of the individual components.

**IARC:** Group 2B: Possibly carcinogenic to humans.

**Other:** No component of this product (present at levels greater than or equal to 0.1%) is identified as a known or anticipated carcinogen by ACGIH, NTP, or OSHA.

#### Reproductive toxicity

No Data Available

#### Teratogenicity

May cause developmental effects. The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

#### Specific target organ toxicity - single exposure (Globally Harmonized System)

Apart from effects causing lethality, no specific target organ toxicity was observed in experimental studies.

#### Specific target organ toxicity - repeated exposure (Globally Harmonized System)

Causes damage to lungs through prolonged or repeated inhalation.

#### Aspiration hazard

Not applicable

#### Additional Information

RTECS: FF5800000 (carbon black)

To the best of our knowledge, the toxicological properties have not been thoroughly investigated.

## SECTION 12: ECOLOGICAL INFORMATION

### 12.1 Toxicity

Component	Green Algae (OECD 201)	Freshwater Fish (OECD 203)	Water Flea (OECD 202)
NMC811	EL50: > 100 mg/l – 96hr	LL50: > 100 mg/l – 96hr (Fathead minnow)	EL50: > 100 mg/l – 48hr
Carbon Black	EC50: 10,000 mg/l – 72hr	LC50: 1,000 mg/l – 96h (zebra fish)	EC50: 5,600 mg/l - 24 h
Poly(vinylidene fluoride)	No data available	No data available	No data available

**NANOMYTE® BE-56E (NMC811 electrode sheet)**

**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 conducted

**12.6 Other Adverse Effects**

Do not allow to enter drains or waterways.

**SECTION 13: DISPOSAL CONSIDERATIONS**

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**13.1 Waste Treatment Methods – Product**

Do not discharge into drains/surface waters/groundwater. Dispose of in accordance with local authority regulations. Disposal requirements are dependent on the hazard classification and will vary by location and the type of disposal selected. All waste materials should be reviewed to determine the applicable hazards (testing may be necessary).

**13.2 Waste Treatment Methods – Contaminated Packaging**

Contaminated packaging should be emptied as far as possible and disposed of in the same manner as the substance/product.

**SECTION 14: TRANSPORT INFORMATION**

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**14.1 Department of Transportation (DOT - US)**

Not classified as a dangerous good under transport regulations

**14.2 International Maritime Dangerous Goods (IMDG)**

Not classified as a dangerous good under transport regulations

**14.3 International Air Transport Association (IATA)**

Not classified as a dangerous good under transport regulations

**14.4 Other**

**HS Code #:** 8507.90

**Schedule B #:** 8507.90.8000

**SECTION 15: REGULATORY INFORMATION**

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**15.1 Safety, Health and Environmental Regulations/Legislation Specific for the Substance or Mixture**

**SARA 302 Components**

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

**SARA 313 Components**

Cobalt lithium manganese nickel oxide (CAS #182442-95-1)

**SARA 311/312 Hazards**

Acute Health Hazard, Chronic Health Hazard

**Right to Know Components**

Cobalt Lithium Manganese Nickel Oxide (CAS #182442-95-1); Poly(vinylidene fluoride) (CAS #24937-79-9); Carbon Black (CAS #1333-86-4); Aluminum (CAS #7429-90-5)

**CALIFORNIA PROPOSITION 65**

This product can expose you to chemicals including Nickel Compounds and Carbon Black (CAS #1333-86-4) which is known to the State of California to cause cancer.

**Toxic Substances Control Act (TSCA) Chemical Substance Inventory**

Cobalt Lithium Manganese Nickel Oxide (CAS #182442-95-1); Poly(vinylidene fluoride) (CAS #24937-79-9); Carbon Black (CAS #1333-86-4); Aluminum (CAS #7429-90-5)

**15.2 Chemical Safety Assessment**

A chemical safety assessment was not carried out for this product.

**SECTION 16: OTHER INFORMATION**

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**REACH Number**

A registration number is not available for this substance as the substance or its uses are exempted from registration, the annual tonnage does not require a registration or the registration is envisaged for a later registration deadline.

**IMPORTANT**

NEI has attempted to provide current and accurate information to the best of its knowledge. NEI makes no representations regarding the accuracy or completeness of the information and assumes no liability for any loss, damage, injury of any kind which may result from or arise out of the use of or reliance on the information by any person. Employers should use this information only as a supplement to other information gathered by them and should make independent judgment of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty and any use of the product not in conformance with this Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

**– END OF SDS –**