
SECTION 1: PRODUCT & COMPANY IDENTIFICATION

1.1 Product Identifiers

Product Name: NANOMYTE® BE-50E (NMC111)

Product Description: Lithium Manganese Nickel Cobalt Oxide electrode sheet

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

Identified Uses: Cathode material for 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)

Skin sensitization (Category 1), H317 [NMC]

Carcinogenicity (Category 2), H351 [NMC & Carbon Black]

2.2 GHS Label elements, including precautionary statements

Pictogram(s): 

Signal Word: Warning

Hazard Statement(s):

H317 May cause an allergic skin reaction

H351 Suspected of causing cancer

Precautionary Statement(s):

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

P232 Protect from moisture

P261 Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray

P272 Contaminated work clothing should not be allowed out of the workplace

P280 Wear protective gloves, protective clothing, & eye protection

P302 + P352 IF ON SKIN: Wash with plenty of soap and water

P308 + P313 IF exposed or concerned: Get medical advice/ attention

P321 Specific treatment (see supplemental first aid instructions on this label)

P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.

P363 Wash contaminated clothing before reuse

P405 Store locked up

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	Synonyms	Formula	CAS #	Concentration
Lithium Manganese Nickel Cobalt Oxide	NMC, NMC111	$\text{LiNi}_{0.33}\text{Mn}_{0.33}\text{Co}_{0.33}\text{O}_2$	346417-97-8	90%
Poly(vinylidene fluoride)	PVDF	$(\text{C}_2\text{H}_2\text{F}_2)_x$	24937-79-9	5%
Carbon Black	Carbon, C	C	1333-86-4	5%
Aluminum Foil	Aluminium	Al	7429-90-5	(substrate)

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.

After Inhalation:

If breathed in, move person into fresh air. If not breathing give artificial respiration. Seek 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:

Never give anything by mouth to an unconscious person. Rinse mouth with water. Seek 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 in section 11.

4.3 Indication of Any Immediate Medical Attention and Special Treatment Needed

No Data Available

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

Wear self-contained breathing apparatus for firefighting if necessary

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. Avoid breathing dust. Ensure adequate ventilation. Evacuate personnel to safe areas.

6.2 Environmental Precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and Materials for Containment and Cleaning Up

Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in closed containers for disposal.

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

Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Provide appropriate exhaust ventilation at places where dust is formed. For precautions see section 2.2.

7.2 Conditions for Safe Storage (including any incompatibilities)

Keep container tightly closed 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
NMC111	346417-97-8	TWA	0.02 mg/m ³	ACGIH Threshold Limit Value (TLV)
Remarks	<i>Pulmonary function; Asthma; Myocardial effects; Confirmed animal carcinogen with unknown relevance to humans</i>			
Carbon Black	1333-86-4	TWA	3.5 mg/m ³	OSHA Permissible Exposure Limit (PEL)
		TWA	3.5 mg/m ³	NIOSH Recommended Exposure Limit (REL)
		TWA	0.1 mg PAHs/m ³	NIOSH Recommended Exposure Limit (REL) (carbon black in the presence of PAHs)
		TWA	3.5 mg/m ³	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:

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.

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:

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

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

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

SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity

No Data Available

10.2 Chemical Stability

Stable under recommended storage conditions

10.3 Possibility of Hazardous Reactions

No Data Available

10.4 Conditions to Avoid

No Data Available

10.5 Incompatible Materials

Strong oxidizing agents

10.6 Hazardous Decomposition Products

Other Decomposition Products: No Data Available (in the event of fire: see Section 5)

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on Toxicological Effects

Acute Toxicity

Oral LD50:	> 6,000 mg/kg (Rat)	[PVDF]
	> 8,000 mg/kg (Rat)	[Carbon Black]
Dermal LD50:	> 3,000 mg/kg (Rabbit)	[Carbon Black]
Inhalation LC50:	No Data Available	

Skin corrosion/irritation

No Data Available

Serious eye damage/eye irritation

No Data Available

Respiratory or skin sensitization

No Data Available

Germ cell mutagenicity

No Data Available

Carcinogenicity

- IARC:** Group 2B: Carbon black is *possibly carcinogenic* to humans based on sufficient experimental evidence on animals and inadequate evidence from epidemiological studies. No other component of this product (present at levels greater than or equal to 0.1%) is identified as a probable, possible, or confirmed human carcinogen by IARC.
- ACGIH:** No component of this product (present at levels greater than or equal to 0.1%) is identified as a carcinogen or potential carcinogen by ACGIH.
- NTP:** No component of this product (present at levels greater than or equal to 0.1%) is identified as a known or anticipated carcinogen by NTP.
- OSHA:** No component of this product (present at levels greater than or equal to 0.1%) is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity

No Data Available

Teratogenicity

No Data Available

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

No Data Available

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

No Data Available

Aspiration hazard

No Data Available

Additional Information

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

SECTION 12: ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to Fish:	LC50 – Danio rerio (zebra fish) > 1,000 mg/l - 96 h	[Carbon Black]
Toxicity to daphnia and other aquatic invertebrates:	EC50 – Daphnia magna (Water flea) > 5,600 mg/l - 24 h	[Carbon Black]
Toxicity to algae:	EC50 - Desmodesmus subspicatus (green algae) 10,000 mg/l - 72 h	[Carbon Black]

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

No Data Available

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Waste Treatment Methods – Product

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

13.2 Waste Treatment Methods – Contaminated Packaging

Dispose of as unused product, clean residue from packaging (do not allow in drains), & dispose of properly.

SECTION 14: TRANSPORT INFORMATION

14.1 Department of Transportation (DOT - US)

Not Dangerous Goods

14.2 International Maritime Dangerous Goods (IMDG)

Not Dangerous Goods

14.3 International Air Transport Association (IATA)

Not Dangerous Goods

14.4 Other

HS Classification #: 2825.90

Schedule B #: 2825.90.9000

SECTION 15: REGULATORY INFORMATION

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

OSHA HAZARDS

Skin sensitizer, carcinogen

SARA 302 Components

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

SARA 313 Components

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards

Acute Health Hazard, Chronic Health Hazard

The following product components are cited on the lists below:

<u>Component</u>	<u>CAS #</u>	<u>List Citations</u>
Lithium Manganese Nickel Cobalt Oxide	346417-97-8	NJ, PA Right to Know
Poly(vinylidene fluoride)	24937-79-9	NJ, PA Right to Know
Carbon Black	1333-86-4	MA, NJ, PA, MN, LA, CA Right to Know

CALIFORNIA PROPOSITION 65

WARNING! This product contains a chemical known to the State of California to cause cancer.

Component: Carbon Black

CAS #: 1333-86-4

15.2 Chemical Safety Assessment

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

SECTION 16: OTHER INFORMATION

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.

HMIS Classification

Health Hazard: 2
Flammability Hazard: 0
Physical Hazard: 0

NFPA Rating

Health Hazard: 2
Flammability Hazard: 0
Reactivity Hazard: 0

Further Information

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 –