NANOSHEL
Creating Miracles in Black

Li lithium Ion
BATTERY MATERIAL

Lithium
Nickel Cobalt Manganese Oxide
NCM111

NS6130-12-001721

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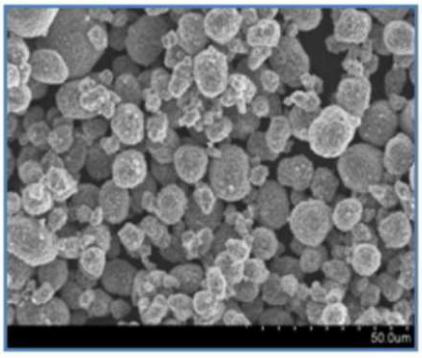
Lithium Nickel Cobalt Manganese Oxide are mixed oxides of lithium, nickel, manganese and cobalt. They have the general formula Li(Ni0.33Co0.33Mn0.33)O2). They are used there on the positive pole side, which acts as the cathode during discharge. Lithium-Nickel-Manganese-Cobalt-Oxide Li(Ni0.33Co0.33Mn0.33)O2), abbreviated as NMC, has become the go-to cathode powder to develop batteries for power tools, e-bikes and other electric power trains. It delivers strong overall performance, excellent specific energy, and the lowest self-heating rate of all mainstream cathode powders, which makes it the preferred option for automotive batteries.

LITHIUM ION BATTERY MATERIAL

SEM analysis



Product	:	**Lithium Nickel Cobalt Manganese Oxide**
Stock No.	:	**NS6130-12-001721 ((NCM111)**
CAS	:	346417-97-8
Purity	:	99.9%
APS	:	10microns
Molecular Formula	:	Li(Ni0.33Co0.33Mn0.33)O2)
Appearance	:	Black Powder
Ni:Co:Mn	:	1:1:1
Ni+C0+Mn (%)	:	57.17%
Melting Point	:	290 °C (>554 °F) – lit.
Boiling Point	:	1342 °C (2448 °F) – lit.
Flash Point	:	26.1°C (79.0 °F
Voltages	:	3.60V, 3.70V nominal; typical operating range 3.0 – 4.2V/cell, or higher
Specific energy (Capacity)	:	150–220Wh/kg
Charge (C-Rate)	:	0.7–1C, charges to 4.20V, some go to 4.30V; 3h
		Charge Typical. Charge current above 1C shortens Battery life.
Discharge (C-Rate)	:	2.50V cut-off
Cycle life	:	1000–2000
Thermal Runaway	:	210°C (410°F) typical. High charge Promotes thermal runaway
Applications	:	E-bikes, medical devices, EVs, industrial

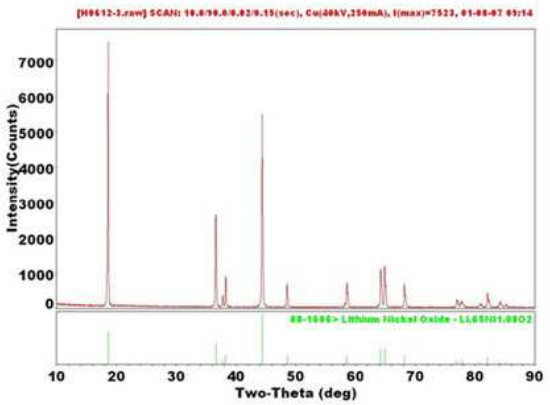
CHEMICAL ANALYSIS

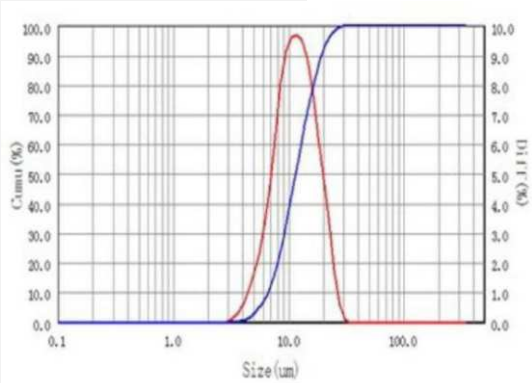
Lithium %	:	7.8%
Ni+Mn+Co	:	57.17%

Impurities

Fe	:	<100ppm
Na	:	<100ppm
Cu	:	<50ppm

XRD





pH	:	10.7
Moisture	:	350ppm
BET Surface Area	:	0.55 m2/g
Tap Density	:	2.2 g/cm3
1st Discharge Capacity	:	155-158 mAH/g
1st Efficiency	:	83-85%

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ISO 9001:2015
CERTIFIED COMPANY

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