Lithium Ion Secondary Battery Cathode Material Ncm532 Nmc Ternary Powder

Item Number: CL02

Introduction

High performance lithium ion secondary battery cathode material NCM532 NMC ternary powder delivers superior energy density structural stability and exceptional cycling efficiency for advanced cell fabrication energy storage systems and electric vehicle research applications.

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Application	Description	Key Benefit
Electric Vehicle (EV) Traction Cells	Active material for prototyping and manufacturing high-capacity pouch, cylindrical (18650/21700), and prismatic traction battery cells.	Balances high specific energy density with robust thermal safety and extended cycle life under dynamic driving profiles.
Stationary Energy Storage Systems (ESS)	Formulation into long-duration energy storage cells for residential, industrial, and microgrid applications.	High structural integrity and minimal capacity fade rate reduce levelized cost of storage (LCOS) over multi-year deployments.
Consumer Electronics & Power Tools	Cathode production for compact, high-drain batteries used in mobile devices, robotics, drones, and cordless power tools.	Delivers high 1C rate capability (155.2 mAh/g) and compact volumetric density to maximize runtime in constrained dimensions.
Academic & Industrial Battery R&D	Standardized benchmark material for evaluating novel solid-state electrolytes, functional liquid electrolyte additives, and advanced binders.	Highly reproducible baseline parameters and tight compositional control ensure accurate, publishable, and commercially translatable experimental data.
Electrode Calendering & Slurry Process Optimization	Pilot-scale optimization of slurry mixing viscosity, roll-to-roll slot-die coating speeds, and electrode calendering densities.	Controlled D50 particle sizing (10.6 µm) and low moisture (0.07%) prevent slurry gelling and yield ultra-smooth, uniform electrode foils.
Hybrid & Solid-State Battery Research	Integration into composite cathode architectures with inorganic solid electrolytes (sulfides, oxides) or polymer electrolyte matrices.	Low specific surface area (0.27 m²/g) and low surface residual base levels mitigate interfacial impedance growth at solid-solid contact boundaries.

Parameter Category	Metric / Property	Unit	Specification Standard	Typical Reference Value	Test Method / Conditions
Product Identification	Product Code / Item Number	-	CL02	CL02	Reference Standard
Product Identification	Chemical Formula	-	LiNi0.5Co0.2Mn0.3O2	LiNi0.5Co0.2Mn0.3O2	Stoichiometric Composition
Product Identification	Physical Appearance	-	Gray-black powder, agglomerate-free	Conforms	Visual Inspection
Product Identification	Standard Packaging	-	500 g / bag	500 g / bag	Sealed Moisture-Barrier Bag
Physical Properties	Particle Size D10	µm	≥ 5.0	6.4	MS2000 Particle Size Analyzer
Physical Properties	Particle Size D50	µm	8.0 – 12.0	10.6	MS2000 Particle Size Analyzer
Physical Properties	Particle Size D90	µm	≤ 25.0	17.5	MS2000 Particle Size Analyzer
Physical Properties	Moisture Content	%	≤ 0.10	0.07	Sartorius Moisture Analyzer
Physical Properties	pH Value	-	≤ 11.6	11.35	Mettler Toledo pH Meter
Physical Properties	Specific Surface Area (BET)	m²/g	0.20 – 0.60	0.27	BET Surface Area Analyzer

Parameter Category	Metric / Property	Unit	Specification Standard	Typical Reference Value	Test Method / Conditions
Physical Properties	Tap Density	g/cm³	≥ 2.0	2.20	ZS-203 Tap Density Tester (3000 taps / 3 mm amplitude)
Chemical Composition	Lithium (Li) Content	%	7.0 – 8.0	7.1	ICP-OES
Chemical Composition	Total Transition Metals (Ni+Co+Mn)	%	57.0 – 62.0	59.2	ICP-OES
Chemical Composition	Calcium (Ca) Impurity	%	≤ 0.0200	0.0035	ICP-OES
Chemical Composition	Copper (Cu) Impurity	%	≤ 0.0050	0.0002	ICP-OES
Chemical Composition	Iron (Fe) Impurity	%	≤ 0.0010	0.0003	ICP-OES
Chemical Composition	Sodium (Na) Impurity	%	≤ 0.0300	0.0188	ICP-OES
Electrochemical Properties	0.5C Coin Cell Specific Capacity	mAh/g	≥ 158	160.1	vs. Li, 0.5C, 2.75V – 4.3V
Electrochemical Properties	1.0C Coin Cell Specific Capacity	mAh/g	≥ 153	155.2	vs. Li, 1.0C, 2.75V – 4.3V
Electrochemical Properties	Initial Coulombic Efficiency (ICE)	%	≥ 83	84.5	vs. Li, 0.5C, 2.75V – 4.3V