

Lithium Cobalt Oxide Lco Cathode Material For Lithium Ion Secondary Batteries

Item Number: CL16



Introduction

High performance lithium cobalt oxide LCO cathode powder engineered for lithium ion secondary batteries featuring exceptional tap density high first cycle efficiency superior rate capability and tight chemical purity for advanced commercial and research energy storage cell manufacturing

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Application	Description	Key Benefit
Consumer Electronics Battery Manufacturing	Fabrication of high-voltage pouch and prismatic cells for smartphones, laptops, wearables, and high-drain handheld devices.	High volumetric energy density and superior compaction density ($4.05\text{--}4.20\text{ g/cm}^3$) allow maximum capacity in space-constrained enclosures.
Standard Full-Cell Cell Production	Commercial cell assembly paired with high-capacity graphite anodes operating at 0.5 V across a $3.0\text{--}4.2\text{ V}$ operating window.	Delivers a stable nominal full-cell design capacity of 145 mAh/g with predictable cycle life and low capacity fade.
Coin Cell R&D and Benchmarking	Assembly of CR2032/CR2016 half-cells and full-cells for cathode baseline testing, binder evaluations, and novel additive screening.	High initial efficiency ($\geq 96.0\%$) and well-defined particle size eliminate material variability during electrochemical research.
Electrolyte Formulation & Additive Studies	Evaluation of novel non-aqueous liquid electrolytes, solid-state electrolyte interfaces, and high-voltage film-forming additives.	Low residual surface Li_2CO_3 ensures clean interfacial reactions and accurate evaluation of electrolyte decomposition mechanisms.
Solid-State Battery Prototyping	Composite cathode fabrication for sulfide-, oxide-, and polymer-based solid-state lithium secondary battery research.	Smooth, unagglomerated gray-black powder with controlled BET surface area ($0.18\text{ m}^2/\text{g}$) provides uniform solid-solid contact.
High-Rate Energy Storage Devices	Production of specialty cells requiring rapid discharge performance and high voltage plateau retention under continuous 1C loading.	Maintains $\geq 151\text{ mAh/g}$ specific capacity at 1C discharge rate without excessive polarization or thermal escalation.

Specification Parameter	Technical Value
Product Item Number	CL16
Chemical Formula	LiCoO_2
Physical Appearance	Gray-black powder, agglomerate-free
Available Packaging Units	100 g/bag , 500 g/bag , 1000 g/bag

Element / Contaminant	Standard Specification	Measurement Method
Lithium (Li)	$6.80\% \text{--} 7.20\%$	Atomic Absorption Spectroscopy (AAS)
Cobalt (Co)	$59.00\% \text{--} 61.00\%$	Complexometric Titration
Sodium (Na)	$\leq 0.0200\%$	Inductively Coupled Plasma (ICP)
Calcium (Ca)	$\leq 0.0200\%$	Inductively Coupled Plasma (ICP)
Copper (Cu)	$\leq 0.0200\%$	Inductively Coupled Plasma (ICP)

Element / Contaminant	Standard Specification	Measurement Method
Iron (Fe)	$\leq 0.0200\%$	Inductively Coupled Plasma (ICP)
Magnetic Impurities	$\leq 300 \text{ ppb}$	Inductively Coupled Plasma (ICP)
Moisture Content	$\leq 0.10\%$	Sartorius Moisture Analyzer
Residual Lithium (Li_2CO_3)	$\leq 0.08\%$	Acid-Base Titration
pH Value	≤ 11.00	Mettler Toledo pH Meter

Parameter	Standard Specification	Measurement Method
Particle Size Distribution D_{10}	$5.5 \mu\text{m}$	MS2000 Laser Particle Size Analyzer
Particle Size Distribution D_{50}	$11.00 \mu\text{m}$ to $14.00 \mu\text{m}$	MS2000 Laser Particle Size Analyzer
Particle Size Distribution D_{90}	$\leq 30.0 \mu\text{m}$	MS2000 Laser Particle Size Analyzer
Specific Surface Area (BET)	$0.18 \text{ m}^2/\text{g}$	BET Surface Area Analyzer
Tap Density	$\geq 2.4 \text{ g/cm}^3$	ZS-Type Tap Density Tester

Test Parameter	Specification Requirement	Test Conditions
0.1C Coin Cell Discharge Capacity	$\geq 157 \text{ mAh/g}$	vs. Li/Li^+ , 0.1C rate, 3.0 V to 4.3 V
1C Coin Cell Discharge Capacity	$\geq 151 \text{ mAh/g}$	vs. Li/Li^+ , 1C rate, 3.0 V to 4.3 V
First Cycle Efficiency	$\geq 96.0\%$	vs. Li/Li^+ , 0.1C rate, 3.0 V to 4.3 V
Full-Cell Design Capacity (Graphite Anode)	145 mAh/g	0.5C rate, 3.0 V to 4.2 V

Operational Stage	Recommendation / Requirement
Pre-Slurry Thermal Treatment	Vacuum bake powder at 120°C for 6 hours prior to mixing
Mixing Environment	Ambient relative humidity strictly controlled at $\leq 30\% \text{ RH}$
Electrode Compaction Density	Target design density: 4.05 to 4.20 g/cm^3
Electrolyte Compatibility	Formulate with matched high-voltage LCO non-aqueous electrolyte
Sealed Storage Conditions	Store sealed away from direct sunlight at $20 \pm 10^\circ\text{C}$, relative humidity $\leq 50\% \text{ RH}$ (Shelf life: 1 year)
Unsealed Handling Conditions	Maintain storage humidity $\leq 30\% \text{ RH}$ after opening; process promptly