Lithium Battery Cathode Material Lithium Iron Phosphate Lifepo4 Powder Lfp

Item Number: CL06

Introduction

Premium lithium battery cathode material lithium iron phosphate LiFePO4 powder LFP delivers superior thermal safety high discharge capacity low moisture and consistent electrochemical stability for advanced energy storage pouch cell fabrication and coin cell battery research testing workflows

Learn More

Application	Description	Key Benefit
Stationary Energy Storage Systems (ESS)	Grid-scale and residential energy storage cells requiring prolonged operational lifespans and deep discharge cycles.	Exceptional cycle life exceeding thousands of cycles with minimal capacity fade and intrinsic structural safety.
Electric Commercial Vehicles and E-Mobility	Heavy-duty electric buses, delivery fleets, and light electric vehicles operating under variable ambient temperatures.	Thermal stability above 600°C that mitigates runaway hazards while lowering raw material costs compared to cobalt-based chemistries.
Coin Cell R&D and Academic Materials Science	High-throughput electrochemical screening, half-cell evaluation, and novel electrolyte/separator testing in research laboratories.	High batch-to-batch repeatability and predictable first-cycle Coulombic efficiency for rigorous baseline benchmarking.
Pouch Cell Pilot Line Manufacturing	Pilot-scale electrode preparation, automated slurry coating, continuous roll calendering, and cell assembly verification.	Pre-conditioned, low-moisture powder enables direct slurry mixing without slurry gelation or pinhole coating defects.
High-Rate Pulse Power Devices	Power tools, uninterrupted power supply (UPS) units, and marine starter batteries requiring high current delivery.	Carbon-coated nanostructure facilitates low internal resistance and fast lithium intercalation dynamics.
Hybrid and Solid-State Battery Development	Next-generation solid-state and semi-solid electrolyte interface studies requiring stable, non-reactive cathode surfaces.	Stable olivine framework prevents transition metal dissolution and minimizes interface impedance degradation.

Parameter	Unit	Variant CL06-01	Variant CL06-02	Variant CL06-03	Test Method / Instrumentation
Appearance	—	Gray-black powder, uniform color, no hard agglomeration	Gray-black powder, no agglomeration	Gray-black powder, no agglomeration	Visual Inspection
First Discharge Capacity (0.1C)	mAh/g	≥ 150.0	—	—	Coin half-cell (vs. Li/Li+)
First Charge Capacity (0.1C)	mAh/g	≥ 154.0	≥ 150.0	≥ 154.0 (Tested: 156.3)	Coin half-cell (vs. Li/Li+)
First Cycle Efficiency (0.1C)	%	≥ 95.0	≥ 90.0	≥ 95.0 (Tested: 97.62)	Coin half-cell ratio
Bulk Density	g/cm³	≥ 0.30	—	—	BT-303 Tap Density Analyzer
Tap Density	g/cm³	≥ 0.80	1.0 ± 0.2	0.8 ± 0.2 (Tested: 0.710)	Tap Density Analyzer
Specific Surface Area (SSA)	m²/g	10.0 ± 1.5	13.0 ± 2.0	12.0 ± 2.0 (Tested: 11.395)	BET Dynamic Adsorption / TriStar II 3020
Electrical Resistivity	Ω·cm	—	—	≤ 100 (Tested: 6.934)	Mitsubishi Powder Resistivity Meter
Moisture Content	ppm	≤ 1000	< 1500	< 1000 (Tested: 667.1)	Karl Fischer Coulometry (200°C heating)

Parameter	Unit	Variant CL06-01	Variant CL06-02	Variant CL06-03	Test Method / Instrumentation
Slurry pH Value	—	8.0 ~ 10.0	—	9.5 ± 1.0 (Tested: 9.20)	pH Meter (10 g LFP in 90 g CO_2-free water)
Microstructure	—	Uniform Morphology	Uniform Morphology	Uniform Morphology	Scanning Electron Microscopy (SEM)

Particle Metric	Unit	Variant CL06-01	Variant CL06-02	Variant CL06-03	Test Conditions
D10	μm	≥ 0.35	< 1.5	≥ 0.25 (Tested: 0.419)	Aqueous dispersion, Malvern Mastersizer 2000
D50	μm	0.6 ~ 1.8	4.0 ± 2.0	1.3 ± 0.5 (Tested: 1.070)	Aqueous dispersion, Malvern Mastersizer 2000
D90	μm	≤ 4.50	< 10.0	< 10.0 (Tested: 2.750)	Aqueous dispersion, Malvern Mastersizer 2000
D97	μm	≤ 7.50	—	—	Aqueous dispersion, Malvern Mastersizer 2000

Element	Unit	Specification (CL06-01)	Specification (CL06-03)	Analytical Test Method
Lithium (Li)	wt%	4.3 ± 0.3	—	Inductively Coupled Plasma (ICP-OES)
Iron (Fe)	wt%	34.5 ± 1.0	—	Inductively Coupled Plasma (ICP-OES)
Phosphorus (P)	wt%	19.5 ± 1.0	—	Inductively Coupled Plasma (ICP-OES)
Carbon (C)	wt%	1.0 ~ 1.5	1.45 ± 0.2 (Tested: 1.42)	High-Frequency Infrared Carbon-Sulfur Analyzer

Impurity Metal	Max Threshold (wt%)	Typical Detection Method
Calcium (Ca)	≤ 0.030% (300 ppm)	Agilent 710 ICP-OES
Sodium (Na)	≤ 0.030% (300 ppm)	Agilent 710 ICP-OES
Magnesium (Mg)	≤ 0.030% (300 ppm)	Agilent 710 ICP-OES
Chromium (Cr)	≤ 0.015% (150 ppm)	Agilent 710 ICP-OES
Manganese (Mn)	≤ 0.010% (100 ppm)	Agilent 710 ICP-OES
Nickel (Ni)	≤ 0.010% (100 ppm)	Agilent 710 ICP-OES
Copper (Cu)	≤ 0.005% (50 ppm)	Agilent 710 ICP-OES
Zinc (Zn)	≤ 0.005% (50 ppm)	Agilent 710 ICP-OES

Parameter	Standard Details
Standard Packaging Configurations	100 g/bag, 500 g/bag, 1000 g/bag (multi-layer aluminum vacuum-sealed bags)
Pre-Processing Handling	Strict moisture-controlled manufacturing allows direct slurry incorporation without customer pre-baking under standard conditions
Shelf Life	24 Months (2 Years) under unopened, dry, and room-temperature storage conditions
Custom Specification Alignment	Specialized particle size distributions, custom carbon coating percentages, or target tap densities can be negotiated and custom-synthesized upon technical review