High Performance Lithium Sulfur Battery Cathode Material Sulfur Carbon Composite Material

Item Number: FZ60

Introduction

Accelerate your next generation energy storage research with high performance lithium sulfur battery cathode material sulfur carbon composite material delivering high initial capacity exceptional cycling stability and optimized tap density for advanced coin and pouch cell prototyping.

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Application	Description	Key Benefit
Next-Generation Li-S Coin Cell R&D	Prototyping and screening advanced liquid electrolytes, fluorinated additives, and lithium nitrate concentrations in CR2032 platforms.	Provides a high-baseline cathode material (1180 mAh/g at 0.1C) to accurately measure electrolyte additive effectiveness.
400 Wh/kg Pouch Cell Prototyping	Fabrication of multi-layer pouch cells targeting high specific energy aviation, drone, and defense energy storage devices.	Demonstrates over 80% capacity retention through 70 cycles with an initial material capacity of 1200 mAh/g.
Binder & Functional Additive Screening	Evaluating novel water-based, conductive, or self-healing binder chemistries (e.g., modified PVDF, PAA, CMC/SBR) under high-loading conditions.	Tight particle size distribution (D50 = 15 µm) ensures consistent slurry dispersion and reproducible adhesion metrics.
Solid-State Battery Development	Integrating sulfur-carbon composites into sulfide, oxide, or polymer-based solid-state electrolyte matrices.	Porous conductive host mitigates volume expansion stress and maintains continuous electronic contact during cycling.
Polysulfide Interlayer & Separator Research	Testing functionalized separators, carbon interlayers, and 2D material barriers designed to block polysulfide migration.	High sulfur loading (75 wt%) provides realistic, demanding chemical conditions to rigorously test barrier efficiency.
Academic Materials Characterization	Conducting in-situ and ex-situ Raman, SEM, TEM, and XRD analysis on sulfur phase transitions and structural evolution.	High graphitic conductivity and uniform sulfur infusion provide clean, reproducible baseline spectroscopy data.

Specification Parameter	Value / Range (Model FZ60)
Active Sulfur Content	75 wt% (Customizable range: 30 wt% – 80 wt%)
Particle Size Distribution (D10)	5 µm
Particle Size Distribution (D50)	15 µm
Particle Size Distribution (Dmax)	33 µm
Tap Density	0.37 g/cm³
Packaging Specification	10 g / bag (Vacuum-sealed aluminum foil)
Standard Lead Time	7 business days
Coin Cell Reference Loading	5.5 mg/cm² (Single-sided coating)
Coin Cell Slurry Formulation	91 wt% Composite Material : 3 wt% Ketjenblack (ECP) : 6 wt% PVDF (Arkema HSV900)
Coin Cell Electrolyte System	1 M LiTFSI + 2 wt% $LiNO_3$ in DOL/DME (1:1 v/v)
Electrolyte-to-Sulfur (E/S) Ratio	14 µL/mg
Coin Cell Capacity @ 0.1C	Initial: 1180 mAh/g; 50th Cycle: 1000 mAh/g
Coin Cell Capacity @ 0.2C	Initial: 1090 mAh/g; 100th Cycle: 860 mAh/g

Specification Parameter	Value / Range (Model FZ60)
Pouch Cell Energy Benchmark	400 Wh/kg System Compatibility
Pouch Cell Electrochemical Metrics	Initial Capacity: 1200 mAh/g; 70-Cycle Retention: >80%