

Highly Spherical And Irregular Hard Carbon Powder Lithium-Ion And Sodium-Ion Battery Anode Material

Item Number: CL23



Introduction

High-purity spherical and irregular hard carbon anode powders engineered for sodium-ion and lithium-ion battery research. Featuring high initial coulombic efficiency, controlled particle size distribution, exceptional purity, and outstanding rate performance for energy storage and advanced cell prototyping.

[Learn More](#)

Application	Description	Key Benefit
Sodium-Ion Battery Research	Serving as the core active anode material in coin cells, pouch cells, and cylindrical Na-ion prototypes.	Accommodates large sodium ions with minimal lattice expansion, delivering up to 283 mAh/g reversible capacity.
High-Rate Lithium-Ion Systems	Formulated into anode slurries for hybrid electric vehicles (HEV) and power tools requiring rapid charge-discharge dynamics.	Wide operating voltage window reduces localized lithium plating risks during high-current pulsing.
Low-Temperature Energy Storage	Utilized in specialized battery packs deployed in sub-zero and extreme-temperature grid environments.	Preserves open interstitial transport channels, preventing rapid impedance increases at sub-zero temperatures.
Binder & Slurry Rheology Optimization	Used in electrode processing studies to test novel aqueous and solvent-based binders (PVDF, CMC/SBR, PAA).	Consistent surface chemistry and low moisture allow accurate determination of binder-particle adhesion mechanics.
Calendering & Density Studies	Evaluated in laboratory roll-pressing and compaction trials to determine optimal electrode porosities.	Spherical grade exhibits uniform mechanical stress dissipation under high calendering pressures without particle fracture.
Stationary Grid Storage Prototyping	Integrated into multi-layer pouch and prismatic cells aimed at cost-effective, long-duration utility storage.	Abundant carbon-based chemistry eliminates dependency on critical raw materials like cobalt and nickel.

Parameter	Unit	Irregular Grade (CL23-IR)	Spherical Grade (CL23-SP)	Test Method / Equipment
Chemical Formula	-	C	C	Structural Standard
Molecular Weight	g/mol	12	12	Standard Atomic Weight
Physical Appearance	-	Black Powder	Black Powder	Visual Inspection
Particle Morphology	-	Irregular	Highly Spherical	Scanning Electron Microscopy
Particle Size D10	µm	3	5	Malvern Mastersizer 2000
Particle Size D50	µm	9	10	Malvern Mastersizer 2000
Particle Size D90	µm	25	27	Malvern Mastersizer 2000
Moisture Content	%	0.02	0.02	Mettler Toledo DL39 Karl Fischer
Carbon Content (C)	%	99.9	99.95	Sartorius BP121S Muffle Furnace KSW
Reversible Capacity	mAh/g	250	283 (Nominal 250–300)	Simulated Cell Evaluation
Initial Coulombic Efficiency (ICE)	%	83.5	85.0	Simulated Cell Evaluation
Primary Battery Suitability	-	Li-ion & Na-ion Anodes	Li-ion & Na-ion Anodes	Electrochemical Validation