

What is the capacitance of porous carbon microspheres?

The as-prepared porous carbon microspheres exhibit a specific capacitance of  $193.8 \text{ F g}^{-1}$  at  $1 \text{ A g}^{-1}$ , good rate capability and long cycle life in a two-electrode system. The superior electrochemical performance can be attributed to both the unique hierarchical porous structure and high graphitization degree.

Can porous carbon microspheres be used as electrode materials in supercapacitors?

The as-synthesized porous carbon microspheres can serve as excellent candidates for electrode materials in supercapacitors to achieve excellent electrochemical behaviors. The as-prepared porous carbon microspheres exhibit a specific capacitance of  $193.8 \text{ F g}^{-1}$  at  $1 \text{ A g}^{-1}$ , good rate capability and long cycle life in a two-electrode system.

Are carbon microspheres suitable for supercapacitor applications?

Low dimensional carbon materials (such as CNTs, graphene, nanocarbon) and their superstructures are promising for supercapacitor applications due to remarkable physical and electrical properties (surface area, conductivity, mechanical properties). Carbon microspheres are zero dimensional materials with regular structure and morphology.

What is the specific surface area and capacitance of PI-derived carbon microspheres?

By using O-rich monomers, the specific surface area and specific capacitance of the PI-derived carbon microspheres were increased to  $1070.7 \text{ m}^2/\text{g}$  and  $263.7 \text{ F/g}$ , respectively, at  $0.5 \text{ A/g}$ . After 10,000 cycles of charge-discharge at  $1 \text{ A/g}$ , the material demonstrated outstanding cycle stability with near to 100 % capacitance retention.

What is a carbon microsphere?

Carbon microspheres are zero dimensional materials with regular structure and morphology. These can be solid, hollow, or core-shell depending upon the precursor materials and synthesis technique.

What is the volumetric capacitance of partially graphitized carbon microspheres?

We report unprecedented volumetric capacitance of  $942.9 \text{ F cm}^{-3}$  in  $2 \text{ M H}_2\text{SO}_4$  for partially graphitized carbon microspheres co-doped with N and O prepared by simple hydrothermal route followed by direct cobalt catalytic pyrolysis, which is comparable to the expensive metal oxide and  $\text{MnO}_2$ -based pseudo-capacitors.

Alternatively, Jiang et al. [168] employed nitrogen-doped porous carbon microspheres (NPCM) as electrodes in lithium-ion capacitors (LIC), with a 3D micro-flower like superstructure generated from ...

capacitance of the hard-carbon microsphere as anode materials in sodium ion capacitors were better than the hard-carbon powder. In terms of their future application, the hard-carbon microsphere materials could be used for high energy and power density Na-ion and Li-ion capacitors with low cost and safety. Keywords: Hard

carbon; Microsphere ...

According to the electrode materials employed, SCs can be classified into three main kinds: electric double-layer capacitors (EDLCs), pseudocapacitors (PCs) and asymmetric ...

The comprehensive utilization of biomass to obtain energy-storage carbonaceous materials with special microstructures is of great significance. Herein, a universal method is proposed to fabricate oriented carbon microspheres (OCMSs) and 3D porous carbon (3DPC) block at the same time via high-temperature hydrothermal "disproportionation" of ...

The assembled NOHPC//hollow porous activated carbon microspheres (HPAC) potassium ion hybrid capacitors deliver a high energy density of 90.1 Wh kg<sup>-1</sup> at a power density of 939.6 W kg<sup>-1</sup> even over 6000 ...

Metal-organic frameworks derived in situ carbon-doped hollow nickel-cobalt phosphate microspheres for high performance zinc-ion hybrid supercapacitors. Author links open overlay panel Jiahui ... Recent progress of cathode materials for aqueous zinc-ion capacitors: carbon-based materials and beyond. Carbon N Y, 185 (2021), pp. 126-151. View PDF ...

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The synthesis of carbon microspheres film composed of nano-onions and its application as flexible supercapacitors. Miao Zhang ... which combines the performance advantages of traditional capacitor and battery that relies mainly ...

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In summary, nitrogen and sulfur co-doped lignin-based carbon microspheres/graphene hydrogel composites were prepared by one-step hydrothermal method, in which the formation of 3D framework, the reduction of graphene oxide, and the combination of carbon microspheres and graphene were simultaneously completed.

Wang et al. fabricated microporous carbon microspheres with a large specific surface area (1106 m<sup>2</sup> g<sup>-1</sup>) using a novel metal-salt catalyzed reaction [21]. The synthesized carbon microspheres exhibited a specific capacitance of 112 F g<sup>-1</sup> at 0.5 A g<sup>-1</sup> in aqueous electrolytes and long cycling performance over 20,000 cycles. However, the ...

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