

Porous carbon nanomaterials for supercapacitors

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Abstract

Electric double layer capacitors (EDLCs) not only have longer cycle life, but also have better rate performance. Therefore, it is widely used in the fields of uninterruptible power supply and automotive energy regeneration system. Carbon materials, as the most commonly used electrode materials for EDLCs, have attracted many researchers at home and abroad due to their large specific surface area, long service life, good electrical conductivity, abundant pore structure and stable chemical properties. It mainly includes zero-dimensional carbon nanodots (CD), one-dimensional carbon nanotubes (CNT), two-dimensional graphene and 3D hierarchical porous carbon. But lower energy density limited its development. In order to solve these problems, people continue to develop carbon materials with high specific capacitance. 3D hierarchical porous carbon has been continuously developed due to its high specific surface area, abundant porosity and low production cost. The reasonable regulation of the pore size plays a decisive role in the electrochemical performance of the carbon material. Generally, micropores and mesopores can provide large surface area and multiple active sites, while macropores can reduce mass transfer diffusion resistance. And micropores play an important role in improving the specific capacitance of materials, especially the micropores with pore diameter of less than 1 nm is the most effective pore for forming double layer.



Biography:

Dongni Ma obtained a bachelor's degree at the age of 23 and entered the Inner Mongolia University of Technology for a master's degree in the same year.

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