Hierarchical FeOx@Polyaniline Core-Shell Hollow Spheres for Electrochemical Eenergy Storage

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In order to develop storage devices with high power and energy densities, eletrodes should hold well-defined pathways for efficient ionic and electronic transport. Herein, we present a high-performance pseudocapacitor based on hierarchical core–shell hollow spheres, FeOx/polyaniline. Hierarchical urchin-like FeOx spheres as backbone material are prepared by a simple, environmental, scalable method through sonochemical-assisted one-pot reaction. Core–shell hollow heterogeneous structures are successfully achieved by surface modification of FeOx with polyaniline using in-situ polymerization. In particular, during this reaction, HCl solution induced the formation of urchin-like shell of polyaniline and simultaneously slight etching of FeOx. As-synthesized FeOx@polyaniline core–shell hollow spheres are found to be excellent promising electrochemical energy storage. Because of offers the fast electron transport and ion diffusion kinetics, high surface area for high specific capacitance and mechanical stability by hierarchical hollow structure.