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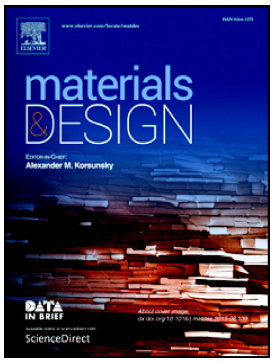

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Preparation and electrochemical performance of hollow activated carbon fiber - carbon nanotubes three-dimensional self-supported electrode for supercapacitor

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Abstract: A three-dimensional self-supported electrode (HACF-CNT) was prepared through carbon nanotubes(CNT) grown on the surface of HACF current collector by chemical vapor deposition when nickel and ethanol were used as catalyst and carbon source, respectively. The HACF-CNT electrode possessed excellent electrochemical properties with specific surface area of 825 m^2/g and specific capacitance of 176 F/g. HACF-CNT electrode was treated by concentrated nitric acid to remove the impurity carbon and nickel particles. The specific capacitance of HACF-CNT electrode increased to 240 F/g after the treatment of concentrated nitric acid. The results of nitrogen adsorption desorption curves showed that larger pore volume and more mesopores were obtained after surface treatment of HACF-CNT electrode. The self-supported electrode of HACF-CNT possessed excellent electrochemical performance.