

# Synthesis and supercapacitor performance of polyaniline/nitrogen-doped ordered mesoporous carbon composites

Huang Jiang, Yang Jun \*

Institute of Applied Electromagnetic Engineering, Huazhong University of Science and Technology, Wuhan 430074, China

\*Corresponding author: Yang Jun, [jyang@hust.edu.cn](mailto:jyang@hust.edu.cn)

## Abstract

The electrochemical property of ordered mesoporous carbon (OMC) can be significantly changed due to the incorporating of electron-donating heteroatoms into OMC. Here, we demonstrate the successful fabrication of nitrogen doped ordered mesoporous carbon (NOMC) materials to be used as carbon substrates for loading polyaniline(PANI) by *in situ* polymerization. Compared with NOMC, the PANI/NOMC exhibits remarkably changed electrochemical specific capacitance with different mass ratio of PANI and NOMC. In a typical three-electrode configuration, the hybrid has a specific capacitance about 276.1 F/g at 0.2 A/g with a specific energy density about 38.4 Wh/kg. What's more, the energy density decreased very slowly with increasing of power density, which is unusual phenomenon for other reports. PANI/NOMC materials exhibit good rate performance and long cycle stability in alkaline electrolyte (~80% after 5000 cycles). The fabrication of PANI/NOMC with enhanced electrochemical properties provides a feasible route to promote its applications in supercapacitors.

**Keywords:** Supercapacitor; Polyaniline; Ordered mesoporous carbon; Specific capacitance