Seong Chan Jun

Yonsei University, South Korea

Doped nano-materials for supercapacitor

Besides multi-stacking or chemical vapor process, advanced doping issues to be resolved arise for high energy and power density storage with high stability and efficiency. The open space with the uniform nano grasses displayed a high areal capacitance, rate capability, energy density, and cyclic stability due to the nanostructure enhancing fast ion and material interactions, which are decorated porous three-dimensional graphitic carbon foam as a supercapacitor electrode. The assembled supercapattery (ASC) provides high specific capacitance (90 F g^{-1}), high energy density (24 Wh kg^{-1}) at power density 830 W kg^{-1}), and long cycle life (specific capacitance retention of 85% over 2000 cycles). The most charging/discharging reaction of supercapacitor or supercapattary only occurs at surface of electorodes. Doped nano materials induced by oxygen related vacancy improve a retention efficiency.

Speaker Biography

Seong Chan Jun is professor in mechanical engineering, Yonsei University, Seoul, Korea since 2008. He worked at Samsung Advanced Institute of Technology (SAIT) (2006-2008) and Nanoscale Science and Engineering Center (NSEC) at Columbia University, NY USA (2001-2005) after finish graduate study from Cornell University (Ithaca N.Y.), and Columbia University (New York, NY) for Ph.D. respectively. His specialty is "optimizing hybrid nano-structures for electronics, photonics, and energy electrodes", focused on physically and chemically modifying nano-structure for science and engineering. Especially graphene and nano-particles are implemented for high efficient devices.

e: scj@yonsei.ac.kr

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