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**Hao Gong***National University of Singapore, Singapore***Ni-based nanomaterials for high efficiency supercapacitors in energy storage**

Nanomaterials have special properties, and have important applications in energy storage and many other devices. For energy storage, supercapacitors have attracted great interest and development. Supercapacitor has found a lot of applications in electric cars and other equipment. Different materials have been proposed and used for supercapacitors. In this presentation, high performance supercapacitors based on nanoscale Ni-based materials, which show very high specific capacitance and energy density are focused. The energy storage performance of such materials and devices are examined and the very high energy storage ability is discussed. Energy storage performance, microstructure, morphology and surface area are found strongly related to Ni and Co oxide structures and morphologies, and the incorporation of some other active materials also enhance performance. 3D core-shell structures contributing to energy storage is presented and discussed. Charged small full supercapacitors prototype will be shown to light up bulb and turn fans for a long time in this presentation.

**Biography**

Hao Gong is a Full Professor of Materials Science and Engineering at National University of Singapore. He is also the Co-ordinator of the Transmission Electron Microscopy Laboratory at Department of Materials Science and Engineering. His research interests include transparent oxide conductors and semiconductors (n-type and p-type), energy storage materials and devices (mainly supercapacitors), energy harvest materials and devices (mainly solar cells), gas sensors, functional thin film and nano-materials, materials characterization (mainly on transmission electron microscopy and electron diffraction). He received his BS degree in Physics at Yunnan University in 1982. He passed his MS courses in Yunnan University, carried out his MS thesis research work at Glasgow University, UK, and received MS degree of Electron and Ion Physics at Yunnan University in 1987. He then did his PhD at Materials Laboratory at Delft University of Technology, the Netherlands, and obtained PhD degree there in 1992. He joined National University of Singapore in 1992, and is currently Full Professor at Department of Materials Science and Engineering. He has published about 200 refereed papers in major international journals.

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