

## CeO<sub>2</sub>-CNT/RGO Nanocomposites for high performance supercapacitor

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### Abstract

Electrochemical Supercapacitors have attracted intense attention owing to their potential to meet the demand of both high power and high energy densities in advanced technologies. The various carbon-based nanocomposites are currently pursued as supercapacitor electrodes to enhance the device performance. Nevertheless, there is a long way to achieve the final goal of designing novel nanomaterials, which could offer exceptionally good electrochemical performance to deal with current energy shortage issue. Novel hybrid material design that can offer excellent electrochemical properties due to synergistic effect of high power density carbon-based materials and high energy density pseudo-capacitive metal oxides nanomaterials is therefore the current challenging issue. In this contribution, we present a new example of metal oxide-carbon nanocomposites to advance the electrochemical performance and to achieve superior capacitance of the electrode. Our novel electrode material composed of homogeneously distributed Cerium oxide nanoparticles on the carbon nanostructures (hybrid of 1D CNT and 2D RGO). The electrochemical measurement show the superior high specific capacitance for the composites materials ca. 250 F/g. This value is better than the RGO-CeO<sub>2</sub> and CNT- CeO<sub>2</sub> composites.

### References

1. Hao Jiang, Pooi See Lee, Chunzhong Li, Energy Environ.Sci., **6** (2013) 41-53
2. Yi Wang, Chun Xian Guo, Jiehua Liu, Dalton Transactions, **40** (2011) 6388-6391

### Figures

