

Nanocomposites to Enhance the Performance of Supercapacitors

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Due to the increase in the use of renewable energy and its unsteady nature, energy storage and distribution system has been getting significant attention during the last two decades. To establish an efficient energy storage system, large capacity supercapacitors together with secondary batteries are essential. Numerous researchers have been trying to develop high performance supercapacitor electrode materials. As the EDLC-type supercapacitors showed limitations in energy density, composites of graphene, CNT, or carbon nano-onion (CNO)-based metal sulfides (or oxides) have been synthesized to improve the performance of supercapacitors. Other materials such as MXene, metal organic framework (MOF), layered double hydroxide (LDH), perovskite have also been studied. Also, three dimensional electrode structure has been getting attention as it provide a large surface area and large pores that enables electrolytes and charges penetrates freely. In this study, we will introduce high-performance nanocomposite electrode materials and their fabrications for supercapacitor devices.