Synthesis of 2D metal carbide derived nanocomposites for an application to ultrahigh volumetric capacitive hybrid energy storage

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The hybridization with 3D graphene has attracted with respect to allow the use of its specific area, high electronic conductivity, high electronic conductivity, and hierarchical structures. Graphene based materials are considered as a promising energy storage materials due to high specific capacitance, superior onductivities, large surface area, and mechanical properties. In this work, Nickel contained nanoparticles are directly branched on the surface of restacking inhibited reduced graphene oxide nanosheets for an application into ultra high capacitive supercapacitor using microwave synthesis method. The precursors of Nickel nanoparticles are intercalated to the layers of rGO sheets and directly changed to metal oxide through the nucleation and growth induced by the microwave irridation. Since the carbon nanotube branches are growth directly on the surface of the carbon nanotube or graphene, excellent interface characteristics can be realized and 3D carbon structure can be obtained in a short time due to microwave synthesizing method. According to these features, it can provide synergetic affect on the energy storage for high capacitive supercapacitors.