

Hybrid Boron Nitride Nanotubes – Carbon Nanostructures Supercapacitor with High Energy Density - Diana Santiago

Electrochemical capacitor energy storage devices have high power density, but low energy density. In contrast battery energy storage devices have high energy density but low power density. Supercapacitors offer the potential for simultaneously achieving high power density and high energy density and are expected to replace batteries as primary energy storage device in the future because of many advantages over batteries. The energy density is limited by the low breakdown voltage of the electrolyte used in EDLCs. The use of boron nitride nanotubes (BNNTs) as insulator between carbon nanostructures electrodes in a solid state supercapacitor device can help to overcome that problem. Being a relatively new material, BNNTs have not been explored as dielectric material in a supercapacitor despite being known as one of the materials with the highest dielectric strength. BNNTs prepared using different precursors have been evaluated in combination with carbon nanotubes (CNTs) to establish the feasibility of the concept.