

Carbon Coated Yarn Supercapacitors: Parametric Study of Performance Output

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Abstract : Evolution of textiles, from its orthodox to more interactive role has stirred the researchers to uncover its application in numerous arenas. The idea of using textile based materials for wearable energy harvesting and storage devices have gained immense popularity. This is mainly due to textile comfort and flexibility features. In this work, nano-carbonous materials were infused on cellulosic fibers using caustic soda treatment. This paper presents the complete procedure of yarn supercapacitors fabrication process through dip coating technique and its characterization method. The main objective is to study, the effect of varying caustic soda concentration on mass loading of activated carbon on yarns and the related capacitance output of the designed yarn supercapacitor. Polyvinyl alcohol and Phosphoric acid were used as electrolyte in a two-electrode cell assembly to measure device electrochemical performance. The results show a promising increase in capacitance value using this technique.

Keywords : yarn supercapacitors, activated carbon, dip coating, caustic soda, electrolyte, electrochemical characterization

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