Flexible Supercapacitors using Liquid Phase Exfoliated Graphene with Enhanced Specific Capacitance

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Graphene was synthesized by liquid phase exfoliation of graphite in DMF (N,N-Dimethylformamide) organic solvent. The synthesized graphene was characterized by TEM, SEM, UV-Visible and Raman spectrum. Graphene based paper electrodes were prepared by brush coating technique on A4 size paper. Four different gel electrolytes PVA/H₂SO₄, PVA/KNO₃, PVA/KCL, PVA/KOH were used for making flexible supercapacitors and their characterization was done using cyclic voltammetry (CV) and galvanostatic charge / discharge (CD) curves. It was observed that PVA/KOH gel electrolyte exhibited maximum specific (Areal) capacitance of 30 $\mu\text{F}/\text{cm}^2$ which is greater than capacitance obtained from PVA/H₂SO₄ gel electrolyte.

Keywords: Liquid phase exfoliation; Organic Solvent; Graphene based electrodes; Flexible supercapacitor; specific capacitance.

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