

## Effect of Ionic Liquids on Physicochemical Properties of Graphene-Ionic Liquid Hybrid Films

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One Promising use of graphene sheets is fabrication of conductive and mechanical films ranging from thin films to paper like materials via flow directed filtration for a broad range of applications. In this work, we demonstrated that ionic liquids (ILs) strongly affected the main properties of graphene-IL (GIL) hybrid films such as, conductivity, solubility, and electrochemical and mechanical properties, and then the enhanced properties of GIL films were applied to application of supercapacitor. In particular, the anion types of ILs played role in control of these properties of hybrid films. In order to investigate physicochemical properties of GIL films, cyclic voltammetry, dynamic mechanical analysis, and thermogravimetric analysis were used in a view of comparison of anion types of ILs. The fine-tuning of surface chemistry of GIL films by ILs was suitable for enhancing performance of energy storage systems as advanced electrodes.