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Solvent Treatment for PEDOT:PSS Conductivity Enhancement

황기환, 정원석, 남상훈, 유정훈, 주동훈, 부진효

Department of Chemistry and Institute of Basic Science, Sungkyunkwan University

The poor conductivity of poly (3,4-ethylene dioxythiophene): poly (styrenesulfonate) (PEDOT:PSS) film hinders to use for a flexible electrode in solar cells. In this report we demonstrate that the conductivity of PEDOT:PSS film can be enhanced by modifying structures in a mixture of PEDOT: PSS aqueous solution and various organic solvents such as polar protic (2-propanol, methanol, ethanol, formic acid) and aprotic solvents (acetone and acetonitrile). To comparatively study the structural effects on the resulted electrical properties, the films are spin-coated on glasses and ITO. At the same time, a contact angle goniometer is used for clarifying a mechanism of wettability of PEDOT (hydrophobic) and PSS (hydrophilic) on the observed conductivity. The structures and electrical properties are investigated by FE-SEM (Field Emission Scanning Electron Microscopy), AFM (Atomic Force Microscopy), and 4-point probe, respectively.

Keywords: PESOT:PSS, Conductivity