

Conductivity Enhancement of PEDOT/PSS Films by Solvent Vapor Treatment

Mitsutoshi JIKEI, Takahiro YAMAYA, Shintaro URAMOTO and Kazuya MATSUMOTO

Department of Applied Chemistry, Graduate School of Engineering and Resource Science, Akita University,
1-1 Tegatagakuen-machi, Akita-shi, Akita 010-8502, Japan

E-mail : mjikei@gipc.akita-u.ac.jp

Poly(3,4-ethylenedioxythiophene)/poly(styrene sulfonate) (PEDOT/PSS) is a promising conductive polymer owing to its transparency, the high stability, and high conductivity. Previous studies have reported that the conductivity of PEDOT/PSS films increases on the addition of polar organic solvents to PEDOT/PSS water dispersion prior to film preparation. In this study, we report the conductivity enhancement in PEDOT/PSS films by solvent vapor treatment of the prefabricated film. In addition to dimethylsulfoxide, *N,N*-dimethylformamide and ethylene glycol, which are known effective additives for enhancing conductivity in PEDOT/PSS films prepared by solvent-addition method, methanol is also effective in enhancing conductivity by solvent vapor treatment. The conductivity of PEDOT/PSS films is enhanced from 5 to 384 S/cm after the solvent vapor treatment by methanol at 35°C. In this study, the effect of treatment conditions and the morphological changes after the vapor treatment have been investigated.

Key Words : PEDOT/PSS / conductivity enhancement / morphology