

ultrafiltration 공정을 통한 고전도도 PEDOT:PSS 투명전극 개발 및 이를 통한 고성능 유기전
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We report a highly conductive, air stable and scalable poly(3,4-ethylenedioxythiophene) (PEDOT) : poly(4-styrenesulfonate) (PEDOT:PSS) transparent electrode for printed flexible devices fabricated using ultrafiltration. By effectively removing excess PSS and various reaction impurities using repeated 100 nm pore membrane filtration, purified PEDOT:PSS show conductivity as high as 2000 S/cm. A highly impressive sheet resistance of $37.8 \pm 4.5 \Omega/\square$ was achieved for PEDOT:PSS film coated from purified solution by addition of dimethyl sulfoxide. The transparent and flexible PEDOT:PSS electrode was applied as source and drain electrodes in printed organic field-effect transistors (OFETs) by spray printing with a shadow mask. A high field-effect mobility of $0.45 \pm 0.04 \text{ cm}^2\text{V}^{-1}\text{s}^{-1}$ for p-channel diketopyrrolopyrrole-thieno[3,2-b]thiophene (DPPT-TT) and $0.05 \pm 0.01 \text{ cm}^2\text{V}^{-1}\text{s}^{-1}$ for n-channel poly([N,N-bis(2-octyldodecyl)-naphthalene-1,4,5,8-bis(dicarboximide)-2,6-diyl]-alt-5,5'-(2,2'-bithiophene) (PNDI2OD-T2)) OFETs was obtained for the purified PEDOT:PSS electrode.