

Investigation of conducting polymer composites with multiple polymeric surfactants and their applications in transistors

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We synthesized the ternary polymer composites of poly(3,4-ethylenedioxythiophene) (PEDOT), poly(styrene sulfonate) (PSS), and poly(vinyl sulfonate) (PVS). Because both PSS and PVS act as polymeric surfactants, we can obtain stable composites dispersed in water. We controlled the ratio of PSS and PVS, and investigated the electrical properties of the composite films, and found that the electrical conductivity can reach ~10 S/cm. We also fabricated and tested organic transistors based on the composites as an active layer to study the composition-performance relationship. Current modulation was obtained through the use of electrolyte-based gating of the composite films.