

High-efficiency near-infrared shielding P(Ani-EDOT):PSS particles with different acid dopant

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We prepared Poly(3,4-ethylenedioxythiophene/aniline) : poly(styrene sulfonate), P(EDOT/Ani):PSS with different type of acid dopants as efficient heat-shielding agents, which showed strong near-infrared (NIR) absorption. The aim of the present work is to study the effect of different type of dopant, namely Sulfuric acid (H_2SO_4), Perchloric acid ($HClO_4$), Hydrochloric acid (HCl), Naphthalenesulfonic acid (NSA), on the electric and optical properties of PANI and PEDOT. The series of P(EDOT/Ani):PSS were prepared through oxidative polymerization methods and doped with different type of acid dopants. It was found that the properties of doped PANI and PEDOT depend on the type and molecular size of the dopant. The maximum NIR-shielding efficiency of the film was 82% with 60% transmittance. The high-efficiency near-infrared shielding P(EDOT/Ani):PSS make it an ideal candidate for heat-insulating materials that find application in semi-transparent heat-insulator-coated windows.