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Fast Switching Polymeric Electrochromics with Facile Processed Water Dispersed Nanoparticles

Xing Xing^{a*}, Qi Zeng^a, Mikhail Vagin^{a,b}, Mats Fahlman^a, Fengling Zhang^{a*}

^aBiomolecular and Organic Electronics, Department of Physics, Chemistry and Biology,
Linköping University, SE-58183, Linköping, Sweden

^bLaboratory of Organic Electronics, Department of Science and Technology, Linköping
University, SE-60174, Norrköping, Sweden

fengling.zhang@liu.se

xing.xing@liu.se

Abstract

In this work, water dispersed electrochromic polymer nanoparticles (WDENs) prepared with miniemulsion process are introduced into electrochromic polymer (ECP) electrode for the first time. The poly [2, 3-bis-(3-octyloxyphenyl) quinoxaline-5,8-diyl-alt-thiophene-2,5-diyl] nanoparticle (NP) electrode shows much faster switching speed than the compacted electrode (e.g. 2.10 s vs. 24.15 s for coloring, 8.65 s vs. 25.95 s for bleaching @ 0.4 V; 1.30 s vs. 9.20 s coloring and 1.7 s vs. 2.90 s for bleaching @ 1.0 V). Moreover, the potentiality of WDENs for universal ECPs is demonstrated. The microelectrochemical measurement indicates much more efficient counter-ion diffusion between the electrolyte and the NP films than the compacted

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