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Thermoelectric transport in ultrathin poly(3,4-ethylenedioxythiophene) nanowire assembly

Jing Zhang^{1,2}, Kun Zhang^{*1,2}, Fujun Xu^{1,2}, Shiren Wang³, Yiping Qiu^{1,2,4},

¹Key Laboratory of Textile Science & Technology (Donghua University), Ministry of Education, Shanghai 201620, PR China

²College of Textiles, Donghua University, Shanghai 201620, PR China

³Department of Industrial and Systems Engineering, Texas A&M University, College Station, TX 77843, United States

⁴College of Textiles and Apparel, Quanzhou Normal University, Fujian 362000, PR China

*Corresponding author. E-mail: kun.zhang@dhu.edu.cn

Abstract

With the highly ordered structure and thus probably fast carrier transport, one-dimensional (1D) conducting polymers are very promising as organic thermoelectric (TE) materials. Many efforts have been made toward the elucidation of TE transport in polymer nanowires assembly; however, the mechanism for the improvement in thermoelectric property is still far from clear. Here, we systematically investigate the TE transport in 12-nanometer-wide poly(3,4-ethylenedioxythiophene) nanowires (PEDOT NWs) assembly. The iron (III) chloride oxidized PEDOT NWs shows high electrical conductivity σ (~540 S/cm), an enhanced Seebeck coefficient S that is 2.6 times of that of poly(3,4-ethylenedioxythiophene):polystyrene sulfonate

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