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Various Magnetoresistance of a New Copolymer, $FeCl_3$ doped Poly(Phenylenevinylene-EDOT-Vinylene) KYUNG HO KIM, Department of Physics and Astronomy, Seoul National University, AJEONG CHOI, WCU Flexible Nanosystems, Korea University, JUN-MO PARK, Department of Chemistry, Seoul National University, SUNG JU HONG, MIN PARK, Department of Physics and Astronomy, Seoul National University, EUN SANG CHOI, National High Magnetic Field Laboratory, Tallahassee, FL, TAE-LIM CHOI, Department of Chemistry, Seoul National University, YUNG WOO PARK, Department of Physics and Astronomy, Seoul National University — We synthesized a new alternating copolymer in which ethylenedioxythiophene (EDOT) and phenylene are alternatively linked by vinylene unit (PPVEDOTV). Temperature dependence of conductivity of the $FeCl_3$ doped PPVEDOTV films followed Coulomb gap variable range hopping (VRH). However magnetoresistance (MR) showed different behaviors despite their similar temperature dependence of conductivity. Among the 4 samples, the MR of the most conducting sample was such that initially positive and decreased as the magnetic field increased and upturned as the field increased further (Type A). 2 other samples showed initially negative MR and it crossed over to positive MR (Type B). Lastly the most insulating sample showed monotonic positive MR (Type C). The MR of type B and C were analyzed as the sum of forward quantum interference (FQI) and wavefunction shrinkage (WS) effects and WS effect only, respectively. For the MR of type A, we propose that the initial positive MR is attributed to FQI in less disordered systems.

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