

Abstract Submitted
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Room Temperature Ferromagnetic Polymer and the Correlated Anomalous Magnetoresistance Phenomenon¹ JINSONG HUANG, University of Nebraska Lincoln, BIN YANG, JEFFREY SHIELD — Organic magnetoresistance (OMAR) has been observed in organic semiconductor devices where resistance can change in a relatively small external magnetic field at room temperature. Since a weak magnetic field is involved, the hyperfine interaction (HFI) is employed to explain OMAR in the reported literatures. None of these issues consider the magnetic properties of the organic semiconductors themselves. However, we recently discovered that polymer semiconductors, such as poly(3-hexylthiophene) P3HT, can have room temperature (RT) ferromagnetic properties in their crystalline phase and when mixed with phenyl-C61-butyric acid methyl ester (PCBM). Here, we will report the possible correlation between the ferromagnetic property of the P3HT:PCBM and anomalous OMAR phenomenon including the anisotropic and hysteretic OMAR behavior. The magnetic property of the polymer including the anisotropic and photo induced change of magnetism will be also discussed to explore the possible mechanism of the room temperature ferromagnetism.

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