

Abstract Submitted
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Spintronic applications of the organic semiconductors¹ JUNG-WOO YOO, CHIA-YI CHEN, V. N. PRIGODIN, C. KAO, A. J. EPSTEIN, The Ohio State University, USA, H. W. JANG, C. W. BARK, C. B. EOM, University of Wisconsin-Madison, USA — Spintronic applications of organic semiconductor have received growing attentions recently. We demonstrated all main operations of the spintronics, the spin injection/detection/transport/polarizing within/between organic non-magnetic/magnetic semiconductors. The thorough study of the device characteristics unravels the physical mechanisms concerning how the spins are transferred into and through an organic semiconductor [1]. The carrier injection into the organic semiconductor is well described by the phonon assisted field emission. The spin valve effects in our devices, which exhibit a charge transfer regime in the bulk of the organic semiconductor, provide proof of the electrical detection of the spin injection and transport across the organic semiconductor layer [1]. Moreover, the organic-based hybrid magnetic system holds an unique perspective of a highly spin polarized electronic structure, suitable for the spintronic applications [2]. The observed tunneling magnetoresistance using the organic-based magnetic semiconductor introduces a new avenue for the realization of the organic spintronics. [1] Yoo et al., Phys. Rev. B in press [2] Prigodin et al., Adv. Mater. 14 1230 (2002)

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