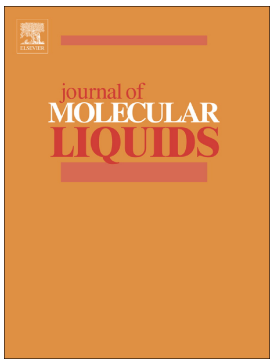

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PII: S0167-7322(18)30315-5
DOI: doi:10.1016/j.molliq.2018.03.019
Reference: MOLLIQ 8793

To appear in: *Journal of Molecular Liquids*

Received date: 20 January 2018
Revised date: 26 February 2018
Accepted date: 5 March 2018

Please cite this article as: Lianbin Niu, Yunxia Guan, Lijia Chen , Spin-orbit coupling effects on energy transfer channel in organic semiconductors. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Molliq(2017), doi:10.1016/j.molliq.2018.03.019

Spin-orbit coupling effects on energy transfer channel in organic semiconductors

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Abstract

Spin-orbit coupling (SOC) effects on energy transfer channel in polymer-phosphorescent dopant system have been investigated. The blue-emitting host polymer, poly [9, 9-di-n-hexyl-fluorenyl-2, 7-diyl] (PFO), was doped into a variety of concentrations between 0.1 and 5% with a red emissive phosphorescent dye, bis (2-[2'-benzothienyl)-pyridinato-N, C3'] iridium (acetyl-acetonate) (BtpIr). The mechanism for the SOC effects on energy transfer channel between the host and the dopant was studied using both photoluminescence (PL) and electroluminescence (EL) techniques. The SOC effect enhances enormously the intersystem crossing (ISC) rate arising by the strong overlap of the delocalized π orbitals of the PFO and BtPIr. The ISC energy transfer channel competes effectively with Förster energy transfer channel and Dexter energy transfer channel. The energy transfer from S_1