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Effects of polymer side chains on the self-assembling of conjugated polymer in thin film YUNFEI JIANG, Chemistry Department, Clemson University, Clemson, SC, 29634-0973, YIQING WANG, School of Chemistry and Biochemistry, Georgia Institute of Technology, Atlanta, GA 30332, UVW H. F. BUNZ, School of Chemistry and Biochemistry, Georgia Institute of Technology, Atlanta, GA 30332, DVORA PERAHIA, Chemistry Department, Clemson University, Clemson, SC, 29634 — Conjugated polymers are inherently semi-conducting and optically active materials, with immense potential applications in organic electro-optical devices. The chemical structure of the polymer including the rigidity of the backbone and the nature of substituents affect their association as well as their electro-optical response. The following work reports the effects of different side chains on the structure and fluorescence of highly conjugated polymer, poly(para phenyleneethynylene) (PPE). When substituted by long polylactide side chains they self-assemble into wires with fingerprint-like arrangement, casting from chloroform solutions on oxidized silicon wafer. With increasing content of poor solvent, the dimension of the structures increased and then crystallized area appeared, as showed in AFM studies. The introducing of the long flexible polymer side chains has significantly reduced the stacking between rigid backbones. This in tern results in a frequency shift in their fluoresces response, indication changes in the electronic levels. Direct measurements of the electronic levels using ATM are currently in progress.

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