Abstract

Morphology-dependent Optical Properties of Substituted Poly(p-phenylene-ethynylene)

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Two different batches of substituted poly(p-phenylene-ethynylene) [PPEs] were synthesized where the substituents dibutyl(a), di-2-ethylhexyl(d) were placed on the 2,5 positions of the phenyl rings. The PA spectrum of PPE(a) shows a polaron band at about 850cm^{-}1. Whereas PPE(d) doesn't show any polaron absorption band. Visible photomodulation spectrum of PPE(a) has two main bands at T = 10K around 1.25eV and 1.9eV plus a broad shoulder at 2.1eV. From PADMR spectrum we found that in PPE(a), the 1.9eV PA has spin 1/2, thus it is long-lived polaron generated in the polymer through photoexcitation, whereas the 1.25eV PA doesn't have any spin 1/2 resonance.

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