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Photo-Induced Electron Transfer in P3DDT, P3OT, M3EH-PPV Conjugated Polymers Blended with Maleic Anhydride in THF Solution Under UV Flash Photolysis Studied by Means of CW TR ESR

Konkin A., Aganov A., Roth H., Ritter U., Scharff P., Egbe D.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

Free-radical signals of positive polarons in conjugated polymer chains and maleic anhydride (MA) anion radicals were registered in poly(3-octylthiophene) P3OT:MA and (poly[2,5-dimethoxy-1,4-phenylene-1,2-ethenylene-2-methoxy-5-(2-ethylhexyloxy)-(1,4-phenylene-1,2-ethenylene)]) M3EH-PPV:MA blends in tetrahydrofuran (THF) solutions under ultraviolet flash photolysis (308 nm) by continuous-wave time-resolved electron spin resonance. Their emissive chemically induced dynamic electron polarization (CIDEP) originated mainly from excited triplet states (triplet mechanism of CIDEP) and partly by from the radical pair mechanism due to the singlet-triplet mixing states. The observed M3EH-PPV polaron spectrum ($g_0 = 2.0029$) supports the supposition that the previously registered CIDEP spectra in P3DDT:MA blends ($g_0 = 2.0021$) can be attributed to the polaron signals instead of the possible solvate electron signal one. © 2011 Springer-Verlag.

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