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Excitation Dependence of Photoinduced Absorption (PA) in Π-Conjugated Polymers[1] YAXIN ZHAI, TEK BASEL, Z. VALY VARDENY, Department of Physics and Astronomy, University of Utah — In order to study the process of singlet fission (SF), where a singlet exciton decomposes into a pair of triplets $S_0 + S_1 \rightarrow T_1 + T_1$, we have investigated the excitation dependence of the photoinduced absorption band of triplet exciton (EXPA) and photoluminescence (EXPL) in various luminescent and non-luminescent π-conjugated polymers. We found that the EXPA spectrum of luminescent polymers is composed of two steps, showing that two different channels are operative for triplet photogeneration. One process starts at the optical gap and has flat response similar to that of the EXPL spectrum. We therefore identify this process as due to intersystem crossing from the lowest lying singlet exciton. Whereas the second process with an onset at $E \approx 2E_T$, where E_T is the triplet energy is due to singlet fission of hot excitons. We also found that the EXPA spectrum of some non luminescent polymers is different from that of the luminescent polymers.

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