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Time resolved photoluminescence studies of long lived emissive specie in F8BT:PFB blends SIMON GÉLINAS, Regroupement Quebecois sur les Materiaux de Pointe, Departement de Physique de l'Universite de Montreal, IAN HOWARD, RICHARD FRIEND, Cavendish Laboratory, University of Cambridge, CARLOS SILVA, Regroupement Quebecois sur les Materiaux de Pointe, Departement de Physique de l'Universite de Montreal — Type-II heterojunctions play a crucial role in organic optoelectronic devices. We use donor-acceptor polyfluorene blends as a model system to understand excited-state dynamics at heterojunctions. These interfacial excitations are intrachain singlet and triplet excitons, geminate polaron pairs, and exciplexes (interfacial charge-transfer excitons). Time-resolved photoluminescence (PL) spectra were taken at 10 K and room temperature to investigate the interconversion dynamics of these species. We observe delayed PL with sub-linear excitation fluence dependence. This implies that delayed singlet exciton generation involves a bimolecular annihilation mechanism. By means of kinetic modeling, we propose triplet-triplet exciton annihilation as a regeneration route to singlet excitons, and subsequently to exciplexes. This points to a significant ($< 15\,\%$) yield of triplet excitons after interfacial charge separation, and to the central role of these species on the interfacial dynamics.

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