Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Enhanced triplet formation in polyfluorene blends THOMAS FORD, NEIL GREENHAM, Cambridge University — Formation of triplet excitons may be an important loss mechanism in organic light-emitting diodes (LEDs) and photovoltaics. Here we use photoinduced absorption spectroscopy to study the generation of triplet excitons after photoexcitation of a blend of the fluorene-based conjugated polymers poly(9,9'-dioctylfluorene-co-benzothiadiazole) (F8BT) and poly(9,9'-dioctylfluorene-co-bis-N,N'-(4-butylphenyl)-bis-N,N'-phenyl-1,4-phenylene-diamine) (PFB). The triplet generation rate is found to be ∼10 times higher in F8BT:PFB than in F8BT alone. We attribute this effect to increased intersystem crossing in the charge-separated states formed at the polymer/polymer heterojunctions in the blend. Applying an electric field dissociates these states and thus reduces the rate of triplet state formation. We will discuss the implications of this result for the operation of polymer blend LEDs and photovoltaics.

Thomas Ford
Cambridge University

Date submitted: 26 Nov 2004 Electronic form version 1.4