Supporting Information for:

Influence of Temperature on Low-Power Upconversion in Rubbery Polymer Blends

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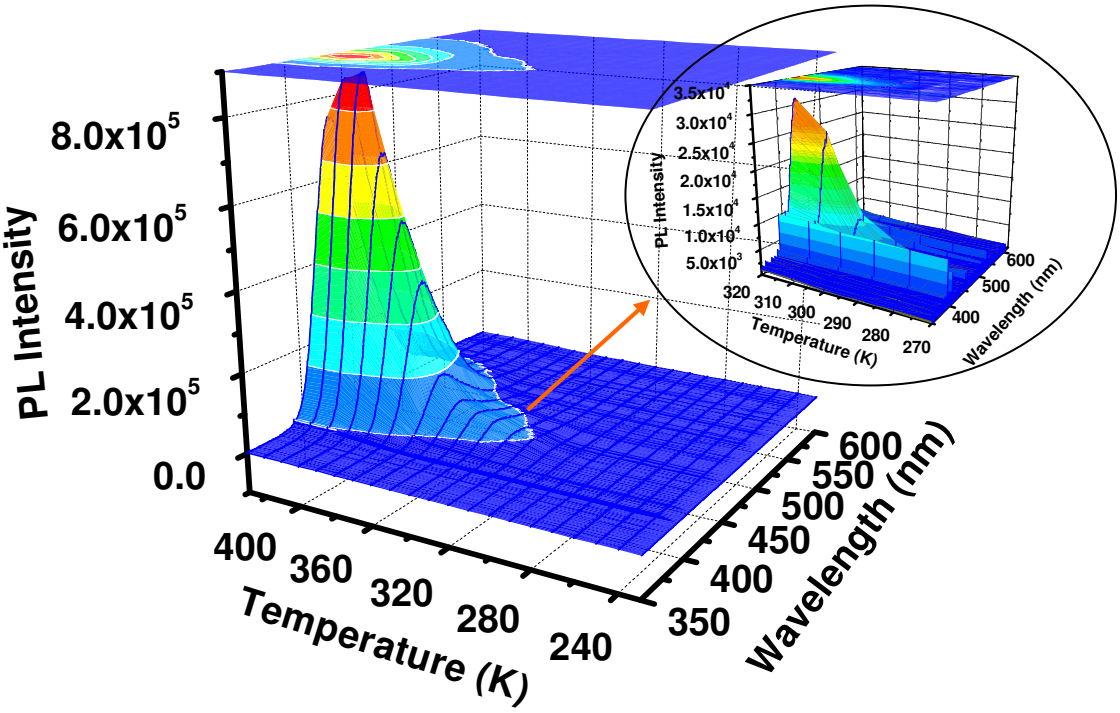

Figure S1. (a) Time-resolved emission profile of an EO-EPI film containing (0.22 mM) PdOEP and (18.1 mM) DPA showing the photoluminescence (PL) intensity as a function of temperature. The inset displays the PL intensity from 270-320 K, λ_{exc} = 544 nm, 2 mJ/pulse at a rate of 10 Hz.

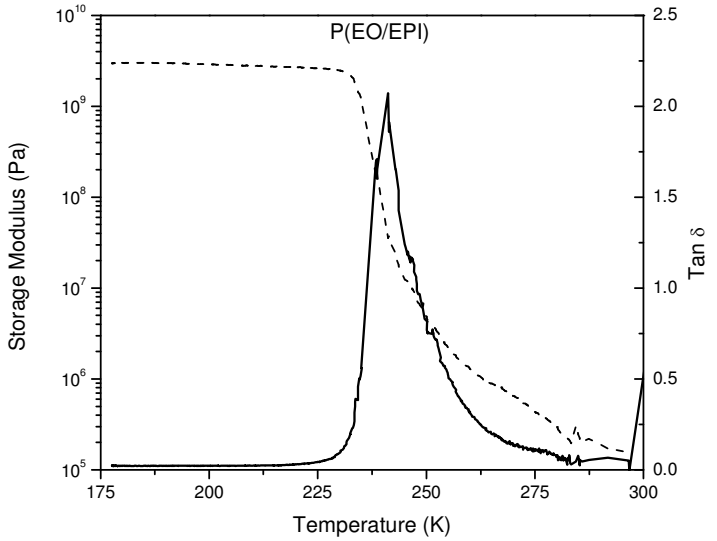

Figure S2. DMTA temperature sweep of a compression molded EO-EPI film depicting the storage modulus (dashed) and loss tangent (solid).

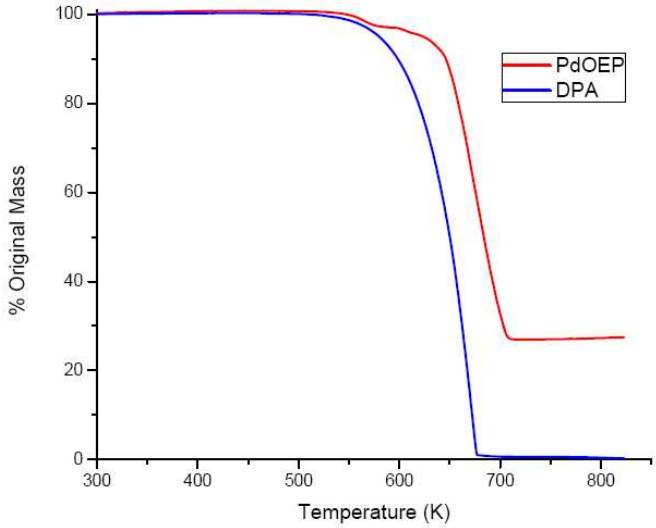

Figure S3. Thermogravimetric analyses of PdOEP and DPA solid powders. Data were recorded under N_2(g) at a heating rate of 10^{o}C/min.

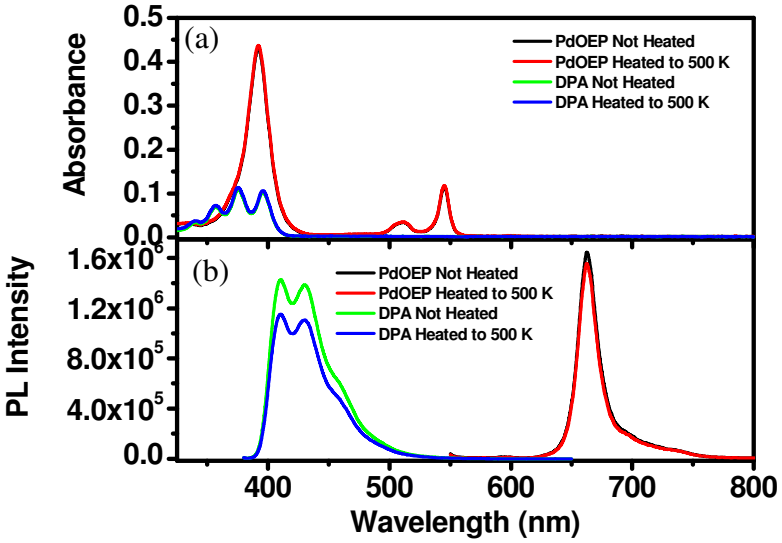

Figure S4. (a) Absorption spectra of PdOEP and DPA in DMF before and after heating the solid powdered chromophores in a Lingberg/Blue Mini-Mite Tube Furnace under aerated conditions to 500 K for 3 hours. (b) Steady-state emission spectra of freeze-pump-thaw degassed solutions of PdOEP and of DPA described in part (a).

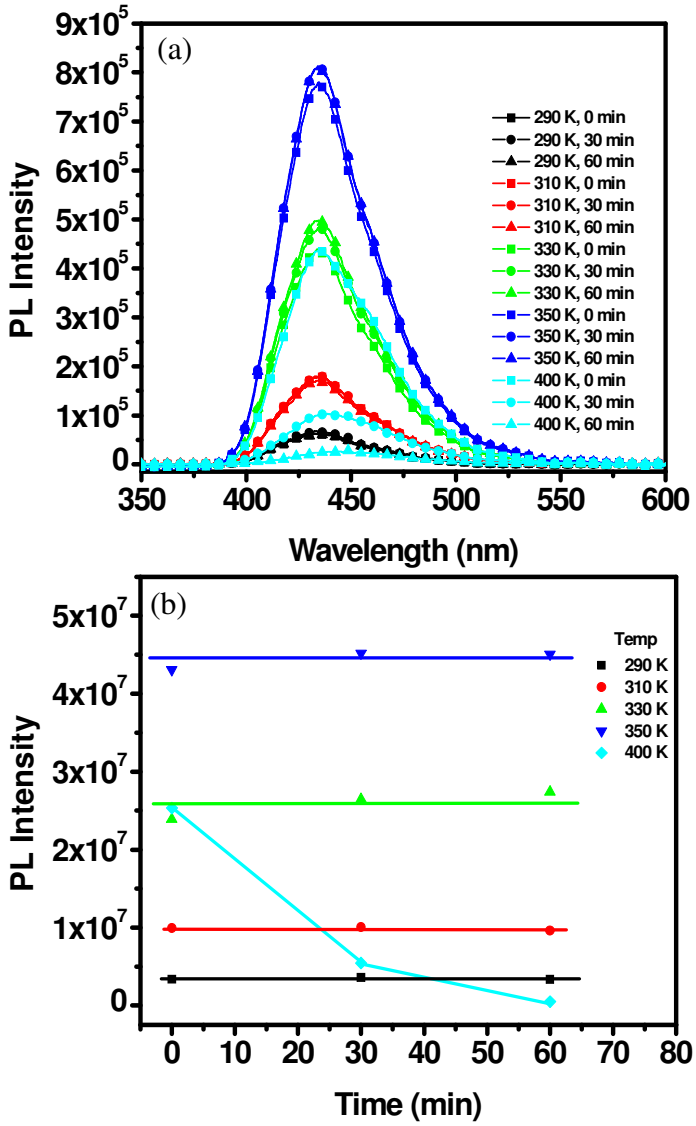

Figure S5. (a) Time-delayed emission spectra of an EO-EPI film containing (0.22 mM) PdOEP and (18.1 mM) DPA measured upon heating the film to temperatures ranging from 280 – 400 K; the film was held at the respective temperatures for 0, 30 and 60 minutes before the emission profile was collected, λ_{exc} = 544 nm, 2 mJ/pulses at a rate of 10 Hz. (b) Emission intensity plot as a function of time for the data shown in part (a).

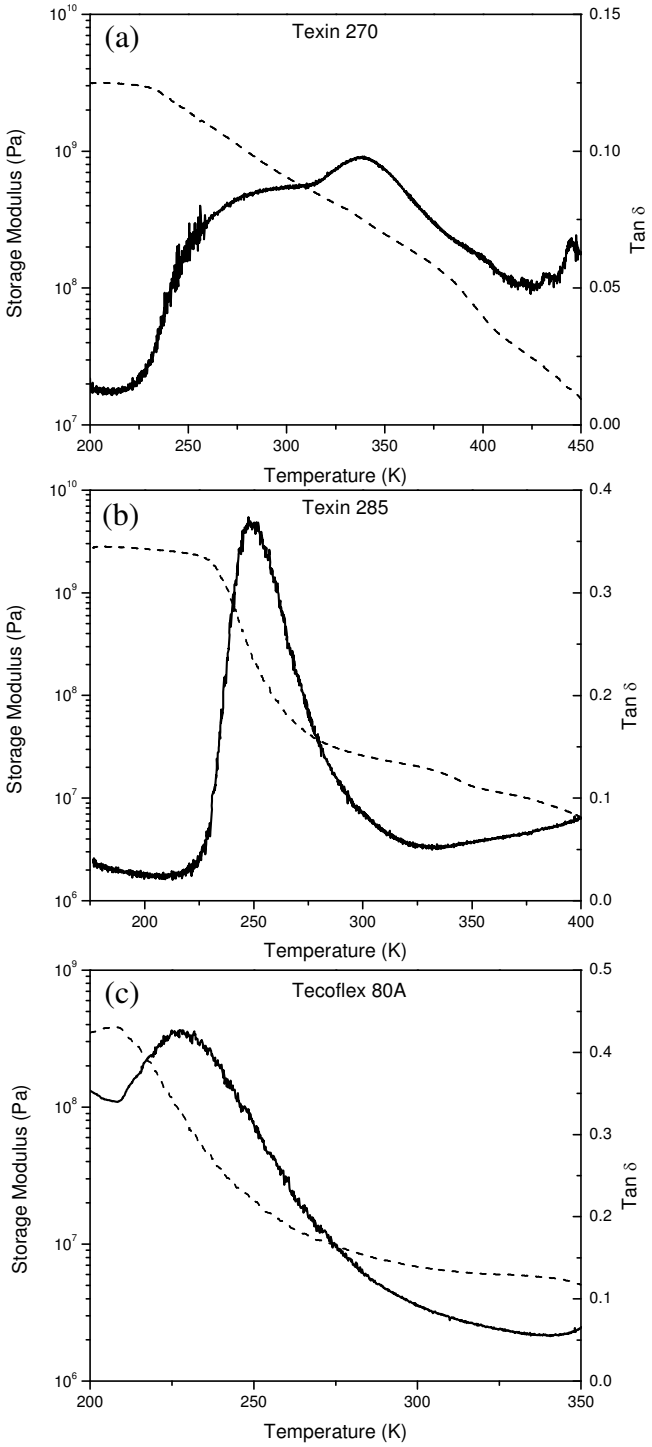

Figure S6. DMTA temperature sweeps of compression molded films. Plots depict the storage modulus (dashed) and loss tangent (solid) for (a) Texin 270, (b) Texin 285, and (c) Tecoflex® EG-80A.

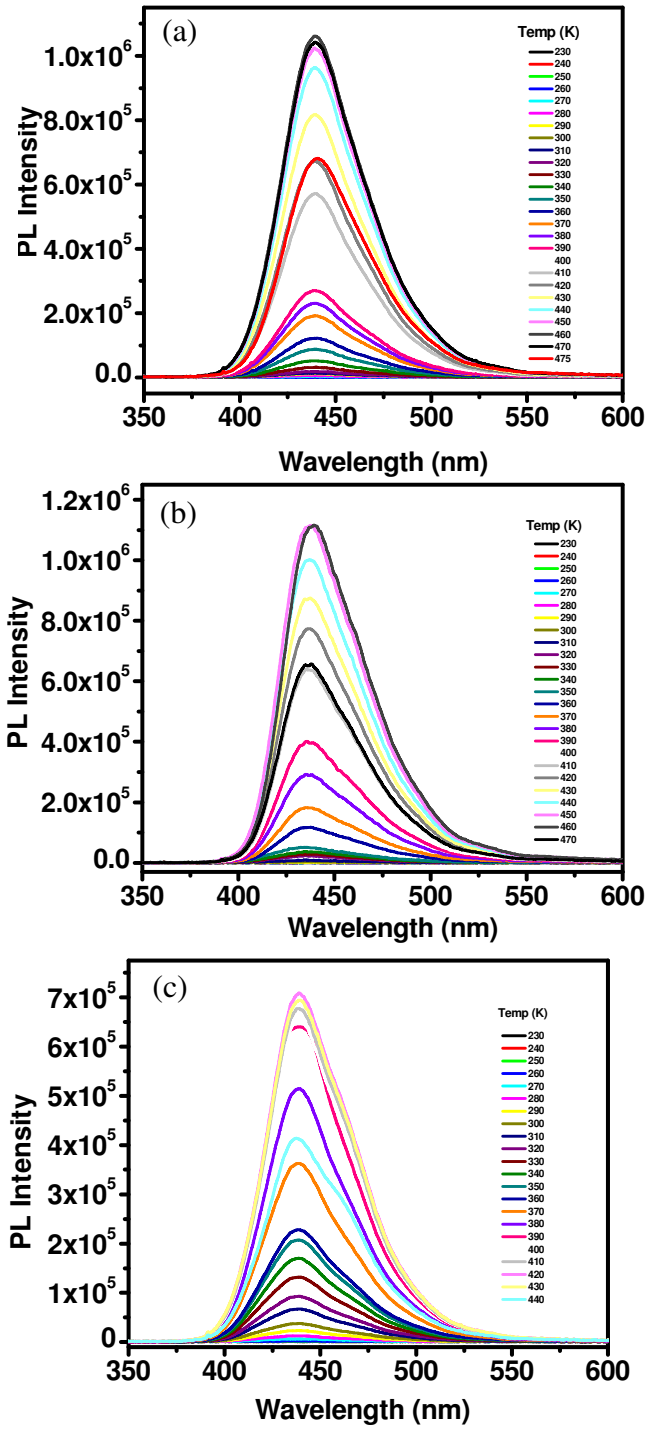

Figure S7. (a) Select upconversion emission profiles of dried thin films of PdOEP (0.20 mM) and DPA (18.0 mM) in the host polymers (a) Texin 270 (b) Texin 285 and (c) Tecoflex® EG-80A measured as a function of temperature upon excitation at 544 nm, with 2 mJ/pulses at a rate of 10 Hz.

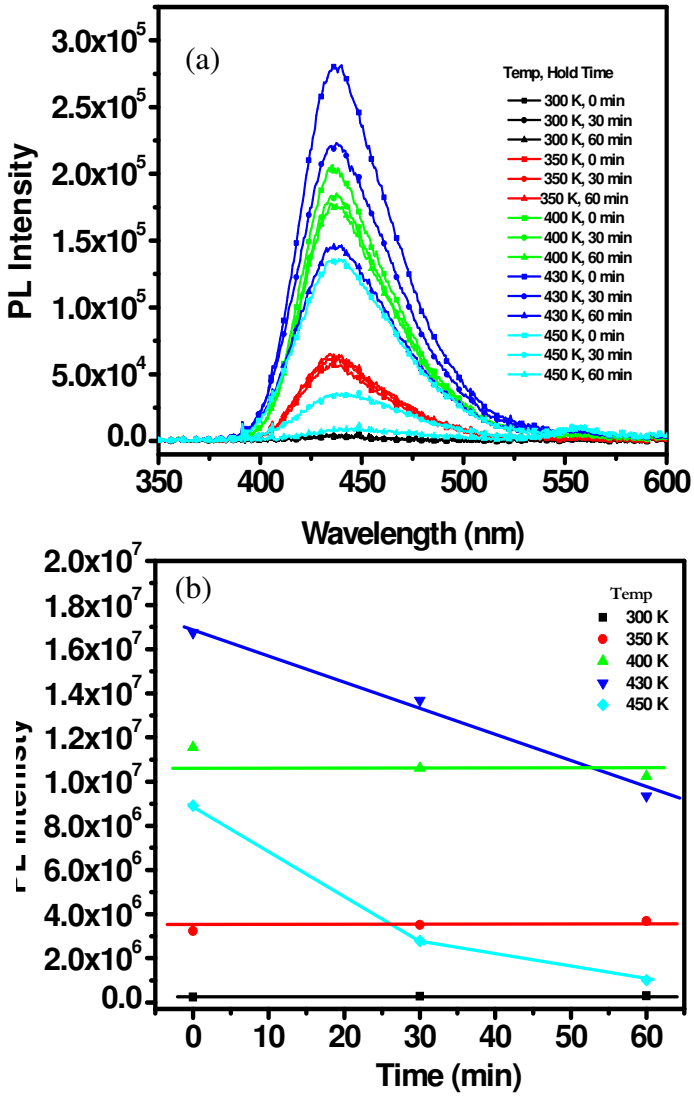

Figure S8. (a) Time-resolved emission profile of a Texin 270 film containing (0.22 mM) PdOEP and (18.0 mM) DPA measured upon heating the film to temperatures ranging from 300 – 450 K; the film was held at the respective temperatures for 0, 30 and 60 minutes before the emission profile was collected, λ_{exc} = 544 nm, 2 mJ/pulses at a rate of 10 Hz. (b) Emission intensity plot as a function of time for the data shown in part (a).

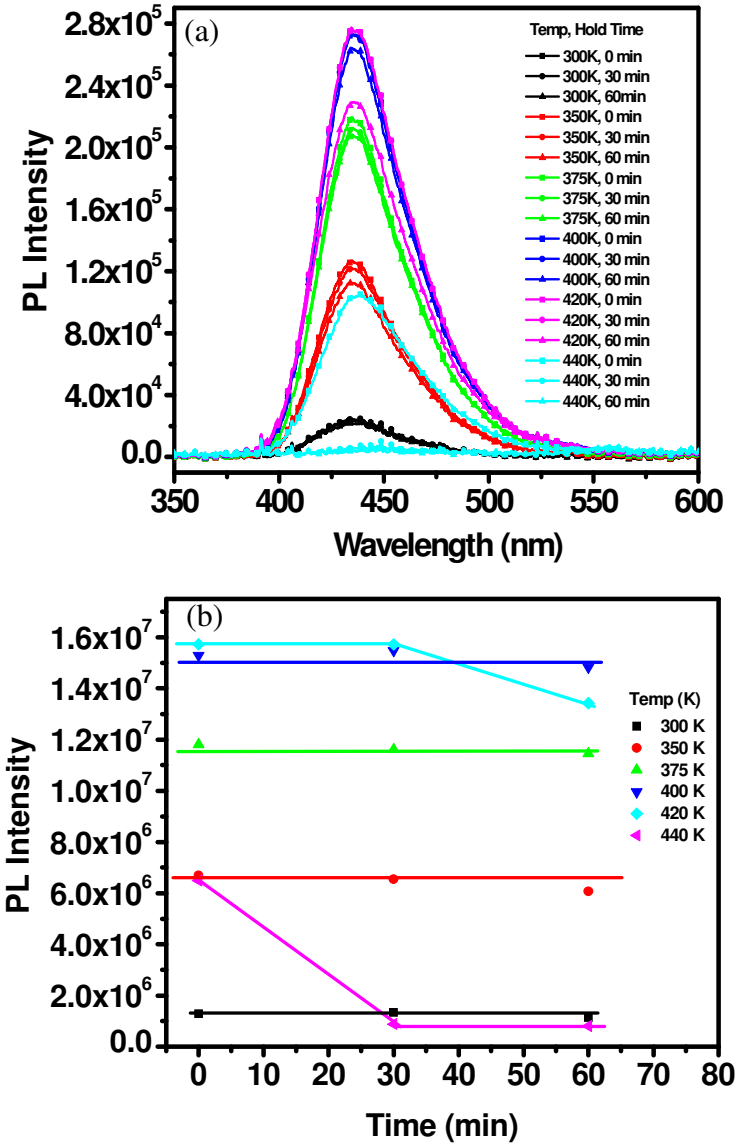

Figure S9. (a) Time-resolved emission profile of a Texin 285 film containing (0.20 mM) PdOEP and (18.0 mM) DPA measured upon heating the film to temperatures ranging from 300 – 440 K; the film was held at the respective temperatures for 0, 30 and 60 minutes before the emission profile was collected, λ_{exc} = 544 nm, 2 mJ/pulses at a rate of 10 Hz. (b) Emission intensity plot as a function of time for the data shown in part (a).

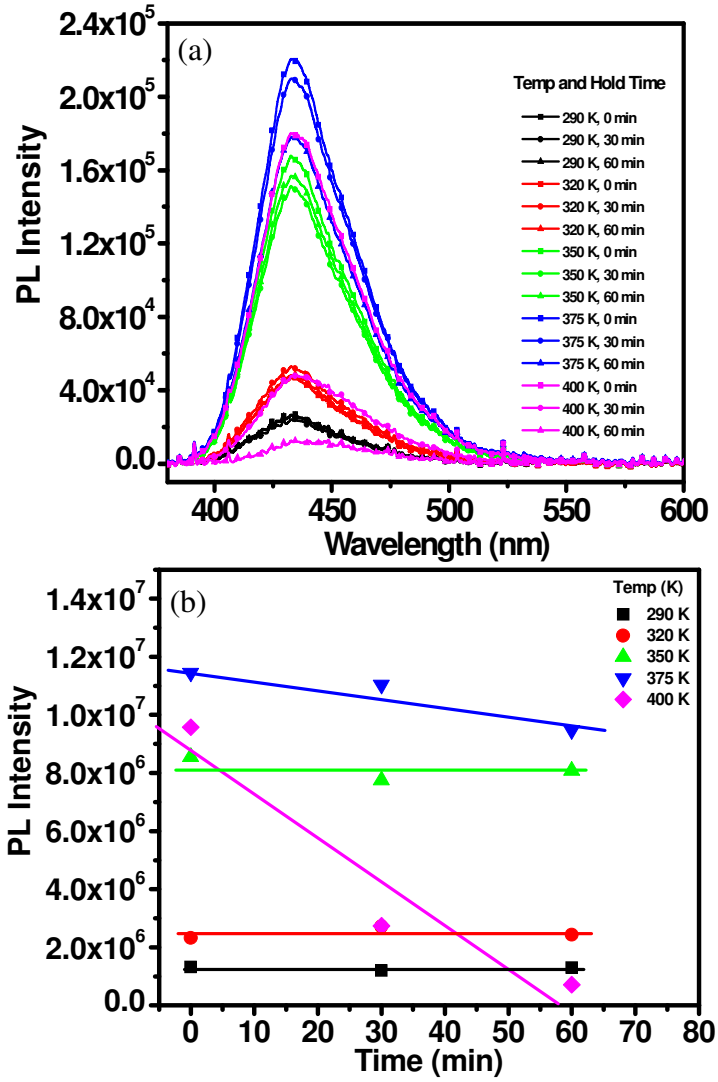

Figure S10. (a) Time-resolved emission profile of a Tecoflex® EG-80A film containing (0.20 mM) PdOEP and (18.0 mM) DPA measured upon heating the film to temperatures ranging from 300 – 450 K; the film was held at the respective temperatures for 0, 30 and 60 minutes before the emission profile was collected, λ_{exc} = 544 nm, 2 mJ/pulses at a rate of 10 Hz. (b) Emission intensity plot as a function of time for the data shown in part (a).

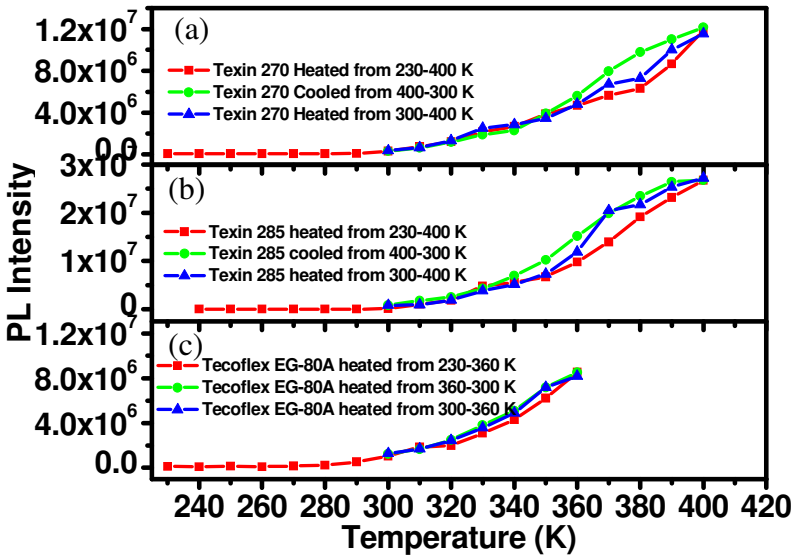

Figure S11. (a) Hysteresis of the upconverted integrated emission intensity of a doped thin film of PdOEP and DPA in (a) Texin 270 (b) Texin 285 and (c) Tecoflex® EG-80A measured as a function of temperature, λ_{exc} = 544 nm, 2 mJ/pulse at 10 Hz.

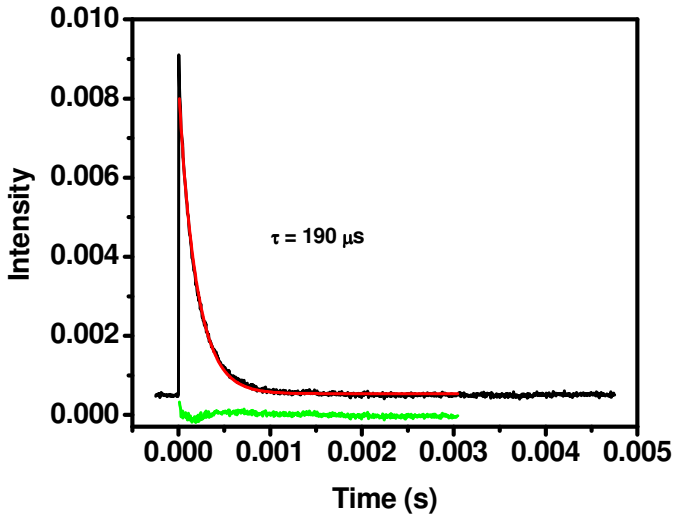

Figure S12. Phosphorescence intensity decay of PdOEP at 670 nm at 320 K in the host polymer Tecoflex® EG-80A. The decay was fitted to a mono-exponential decay function and the solid red line represents the exponential fit to the data and the green line is the residual plot of the fit illustrating the inadequacy of this model.