Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C
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Control of Photo-induced Excimer Formation of Pyrene-labeled Polymers for Optical Recording

Ming-Chia Li, Rong-Ming Ho* and Yu-Der Lee*

Supplementary Information

Figure S1 ^{1}H NMR spectrum of pyrene-labeled PCL

Figure S2 3D correlation of GPC elution volume and in-line diode array UV/Vis spectra for pyrene-labeled PDLA (THF, 0.5wt%).

Figure S3 3D correlation of GPC elution volume and in-line diode array UV/Vis spectra for pyrene-labeled PLA (THF, 0.5wt%).

Figure S4 3D correlation of GPC elution volume and in-line diode array UV/Vis spectra for pyrene-labeled PCL (THF, 0.5wt%).

Figure S5 Optical micrographs of pyrene-labeled PLLA thin-film recorded samples without reading illumination (left) and with reading illumination (right) upon illumination at 340 nm;

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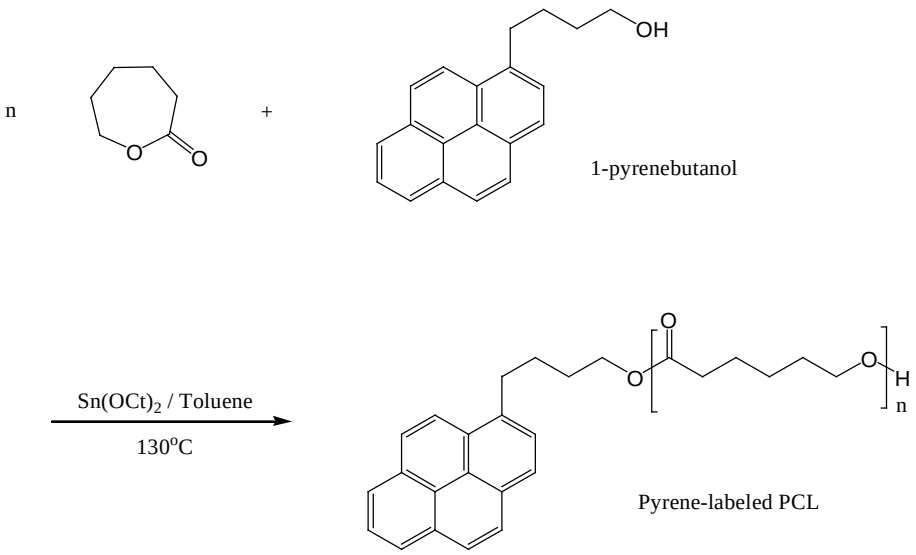
Scheme S1. Synthesis of pyrene-labeled PCL



The detailed procedures for the synthesis of the pyrene-labeled PCL were described in following procedures; a mixture of ε-caprolactone, 1-pyrenebutanol, stannous(II) 2-ethyl hexanoate ($Sn(Oct)_2$) and Toluene was mixed in a round-bottom flask under nitrogen at room temperature. The system was then sealed and heated at 130°C in oil bath for 6h to yield pyrene-labeled PCL. The mixture was then quenched by the addition of methanol and the resulting polymer was precipitated to give white solids. The product was then collected by vacuum filtration to give white solids. The final solid was washed by MeOH and dried under vacuum at 50-60°C overnight to yield pyrene-labeled PCL. **Fig. S1** shows the NMR analysis of pyrene-labeled PCL.

All manipulations were carried out under a dry nitrogen atmosphere. Solvents, ε -caprolactone, 1-pyrenebutanol and Chloroform-d_3 were purified before uses. ^1H nuclear magnetic resonance (NMR) spectra were recorded on a Varian Unityinova

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500 NMR spectrometer with chemical shifts given in ppm from the central line of $CHCl_3$. The GPC measurements were performed on Waters 1515 isocratic HPLC pump equipped with a Waters 2414 RI detector using THF (HPLC grade) as an eluent. Molecular weight and molecular weight distributions were calculated using polystyrene as standard. The number average molecular weight and polydispersity (PDI) of pyrene-labeled polymers were obtained by GPC analysis.

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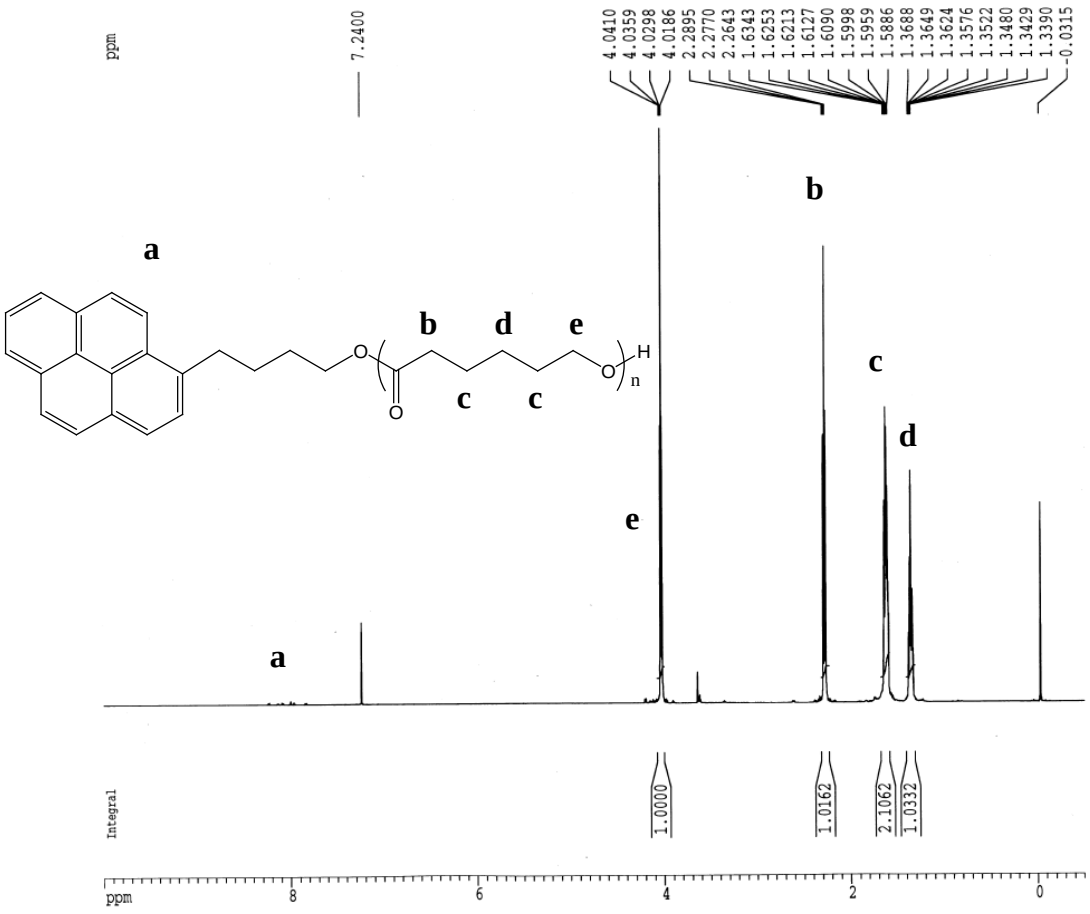

Figure S1. ^{1}H NMR spectrum of pyrene-labeled PCL

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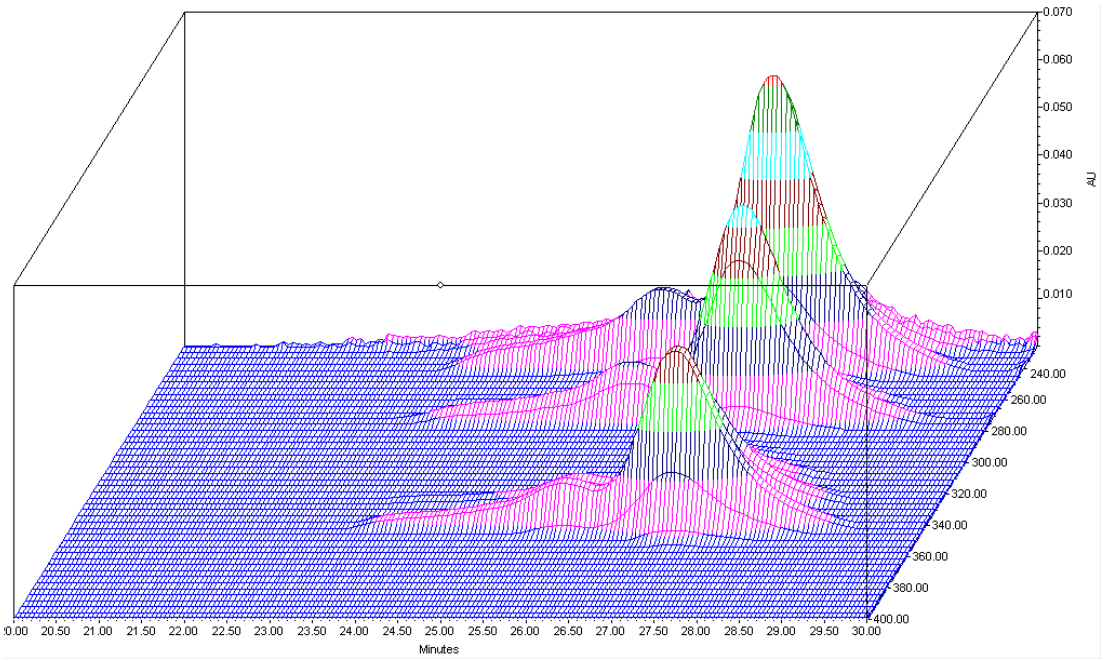

Figure S2. 3D correlation of GPC elution volume and in-line diode array UV/Vis spectra for pyrene-labeled PDLA (THF, 0.5wt%).

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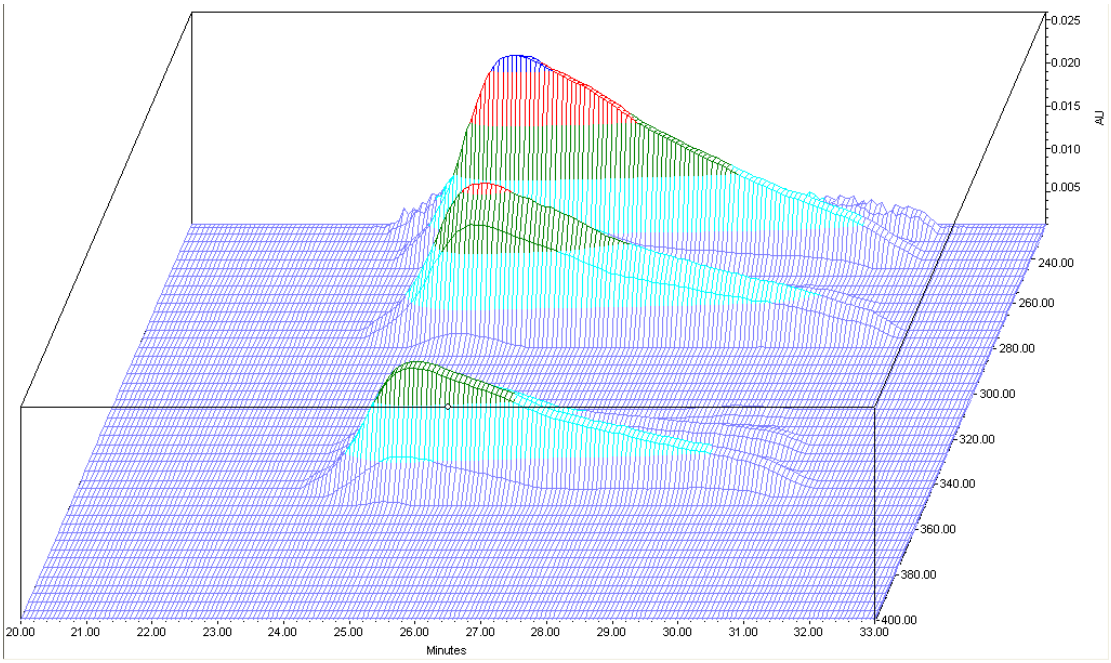

Figure S3. 3D correlation of GPC elution volume and in-line diode array UV/Vis spectra for pyrene-labeled PLA (THF, 0.5wt%).

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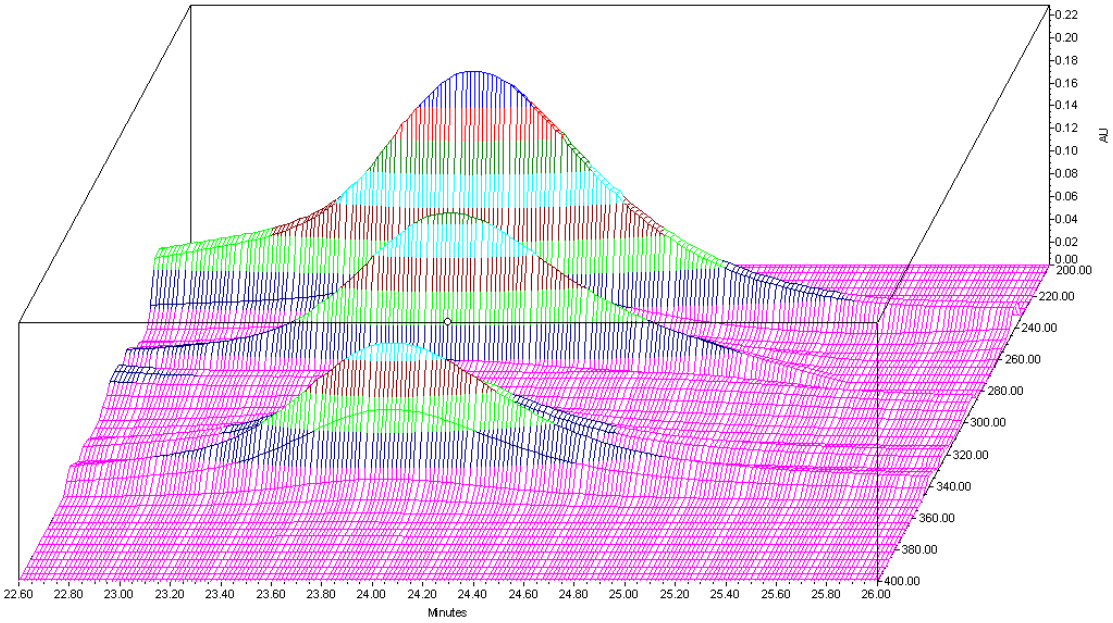

Figure S4. 3D correlation of GPC elution volume and in-line diode array UV/Vis spectra for pyrene-labeled PCL (THF, 0.5wt%).

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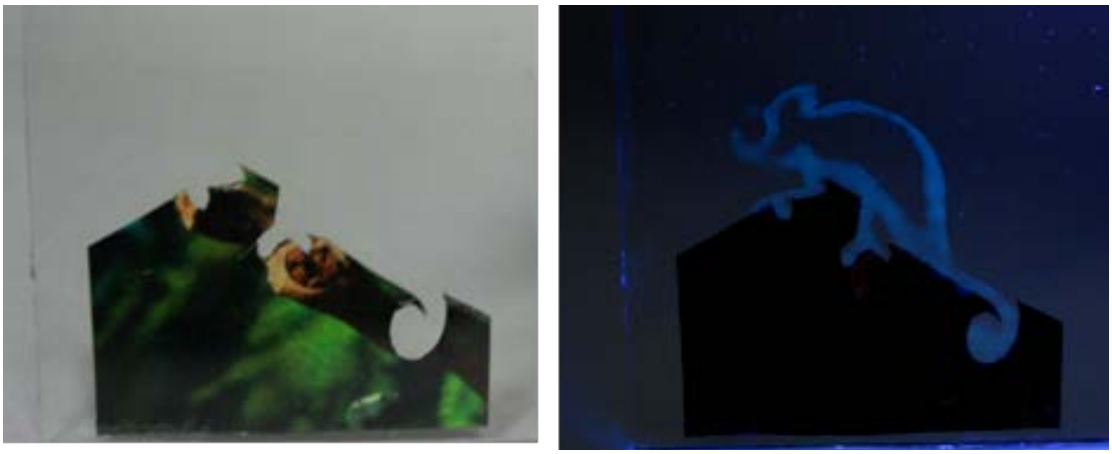

Figure S5. Optical micrographs of pyrene-labeled PLLA thin-film recorded samples without reading illumination (left) and with reading illumination (right) upon illumination at 340 nm;