Supporting Information

Luminescent lanthanide-containing Chiral Liquid Crystalline Polymers in the Side Chain

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Synthetic procedures for Undecylenylacyl chloride

Undecylenoic acid (18.4 g, 0.1 mol) and thionyl chloride (35.7 g, 0.30 mol) were added into a round flask equipped with an absorption instrument of hydrogen chloride. The mixture was stirred at room temperature for 1 h, then heated to 60 °C, and kept for 5h in a water bath to ensure that the reaction finished. The mixture was distilled under reduced pressure to obtain Undecylenylacyl chloride at 160-170 °C (20 mmHg) in the yield of 71%.

Synthetic procedures for *Sm (TTA)$_3$ AA (Sm-M$_3$)*

Anhydrous samarium chloride (2.57 g, 10.0 mmol), which was prepared from Sm_2O_3, ammonium chloride and hydrochloric acid, was dissolved in 20 mL of benzene and anhydrous 2-propanol (1:1). The mixture was heated to 50 °C for 12 h under N_2, and then this stirred solution was added a solution of sodium isopropoxide (2.46 g, 30.0 mmol) in 20 mL of 2-propanol. The mixture was refluxed for 4 h to synthesize samarium isopropoxide and a solution of 2-thenoyltrifluoroacetone (6.66 g, 30.0 mmol) in 30 mL of benzene was added dropwise. After this solution was refluxed for 2.5 h, a solution of acrylic acid (0.72 g, 10.0 mmol) in 20 mL of benzene was added. The reactive mixture was refluxed for 3 h. After cooling to room temperature, the mixture was filtered. The product was obtained after the solvent evaporated and

washed three times with cyclohexane and dried under vacuum at room temperature for 12 h. Yield: 63%.

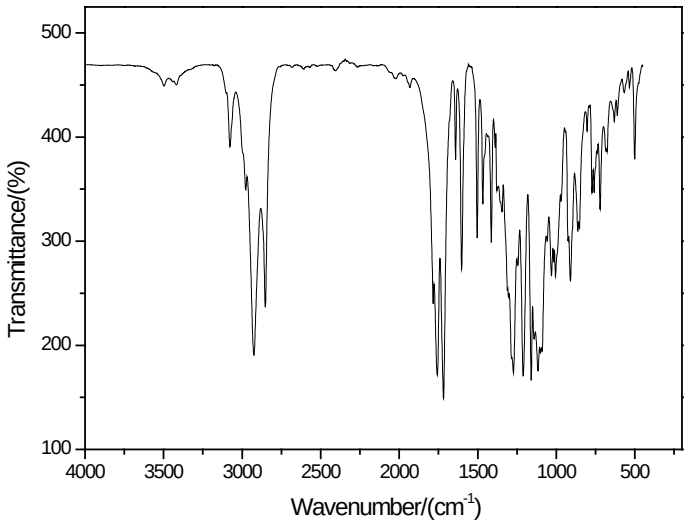

Figure S1. FT-IR spectrogram of M_1

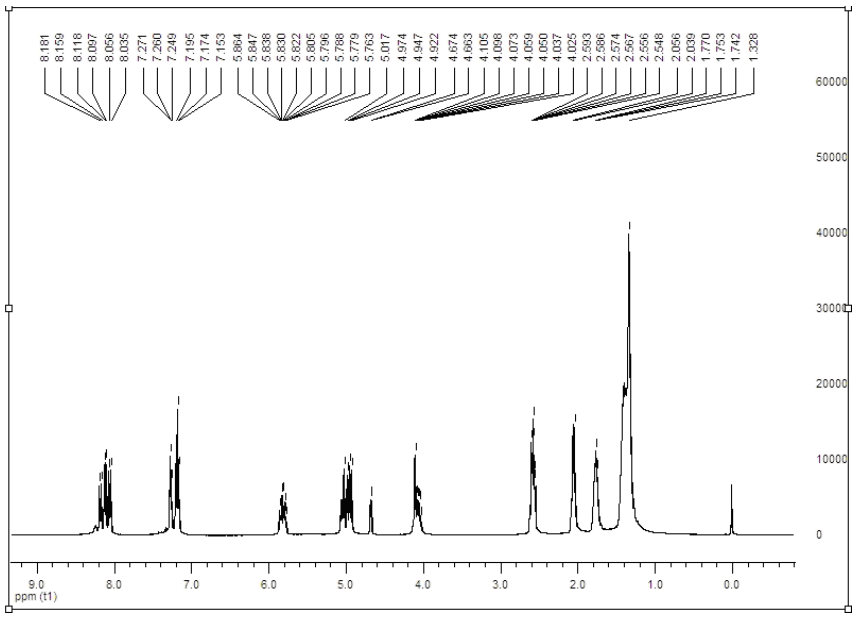

Figure S2. ^{1}H NMR spectrum of M_1 (600 MHz, $CDCl_3$).

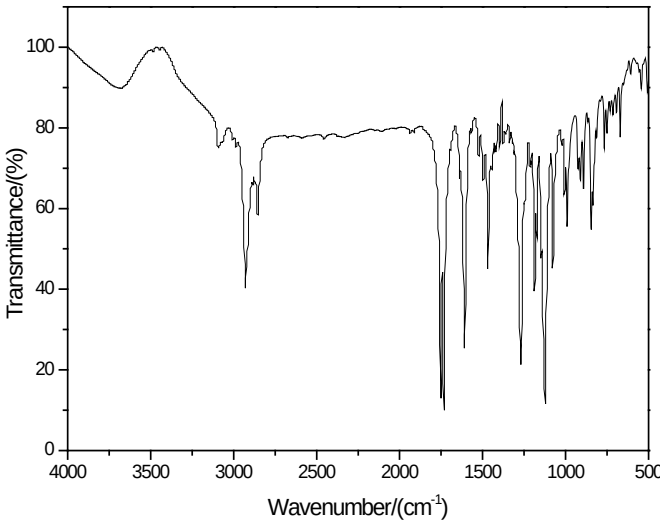

Figure S3. FT-IR spectrum of M_2

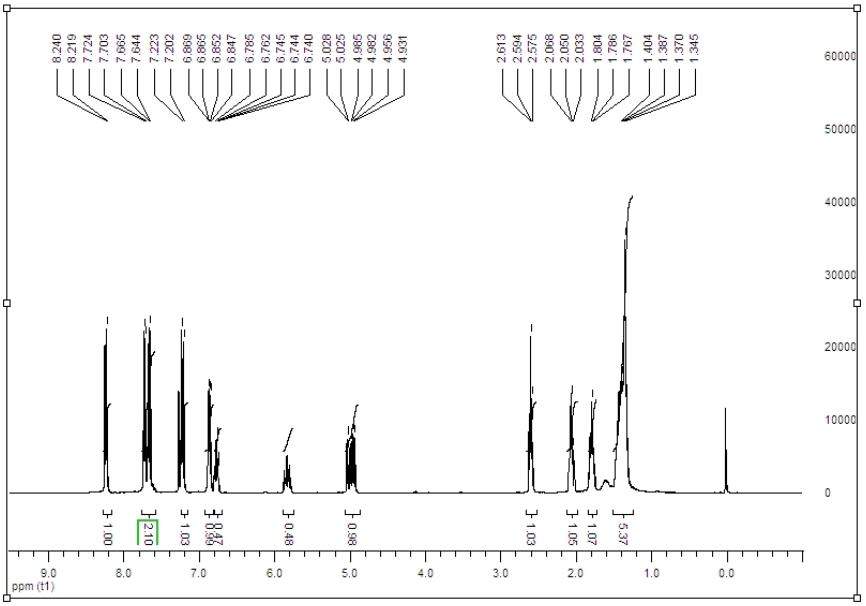

Figure S4. ^1H NMR spectrum of M_2 (600 MHz, $CDCl_3$).

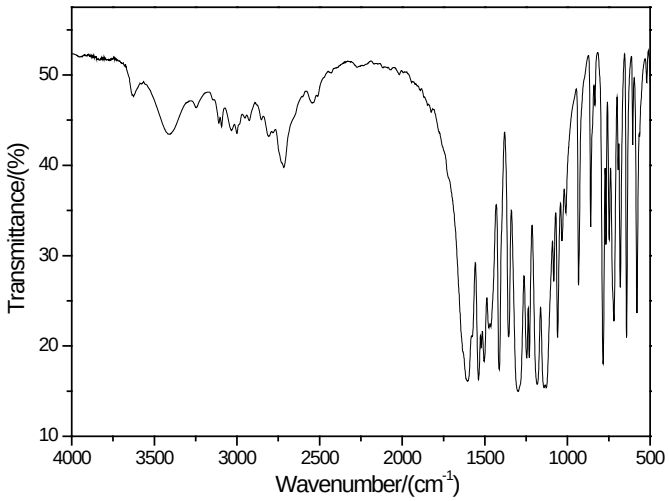

Figure S5. FT-IR spectrum of Sm-M_3.

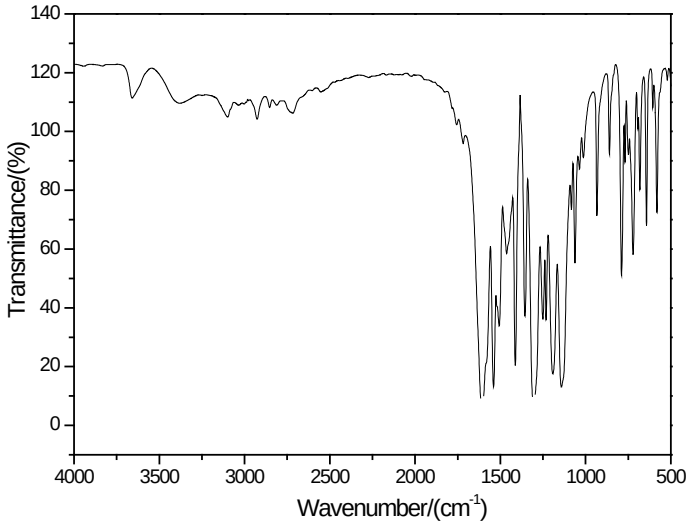

Figure S6. FT-IR spectrum of Eu-M_3.

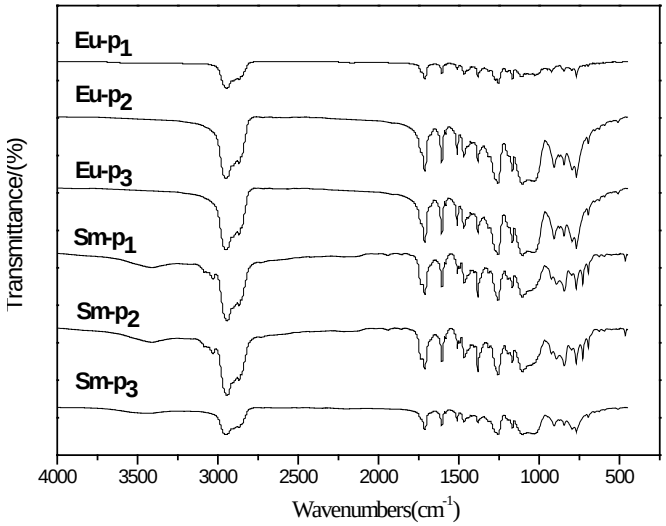

Figure S7. FT-IR spectrum of polymers

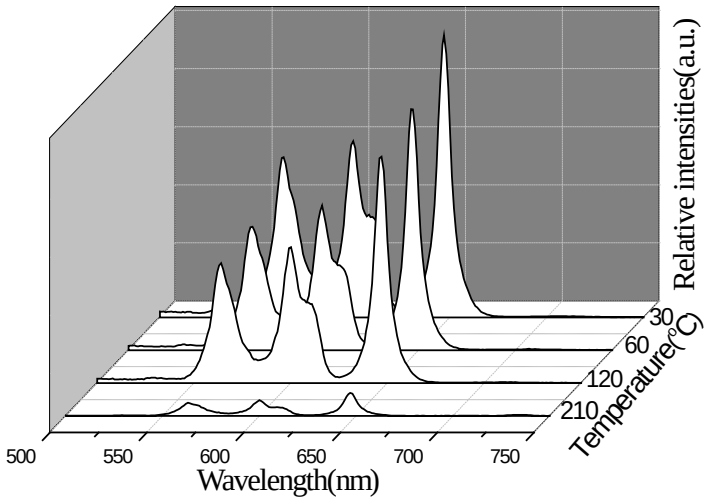

Figure S8. Temperature-dependent emission spectra of Sm-P_1