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Supporting Information for

Patterned Fluorescence Films with Reversible Thermal Response Based on the Host-guest Superarchitecture

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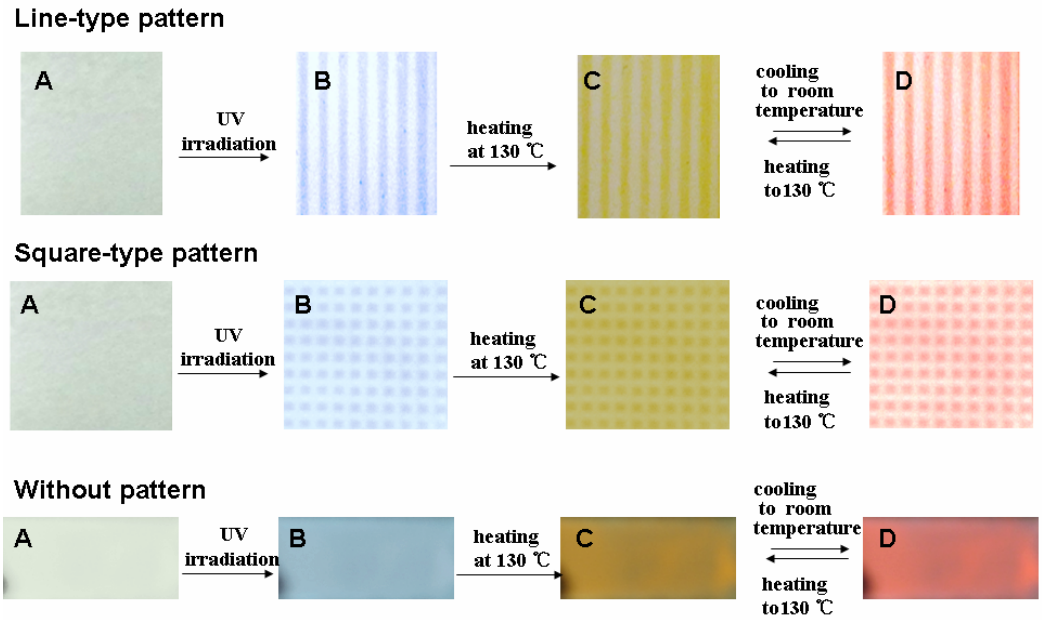

Figure S1. The PDA/LDH films induced by UV irradiation and their thermochromic behavior (top: 500 μm wide line; middle: 500 μm square and 500 μm spacing; below: no pattern): (A) the DA/LDH film; (B) the PDA/LDH film obtained by UV irradiating (A) for 5 min; (C) the film by heating (B) at 130 °C for 1 min, (D) the film by cooling (C) to room temperature.

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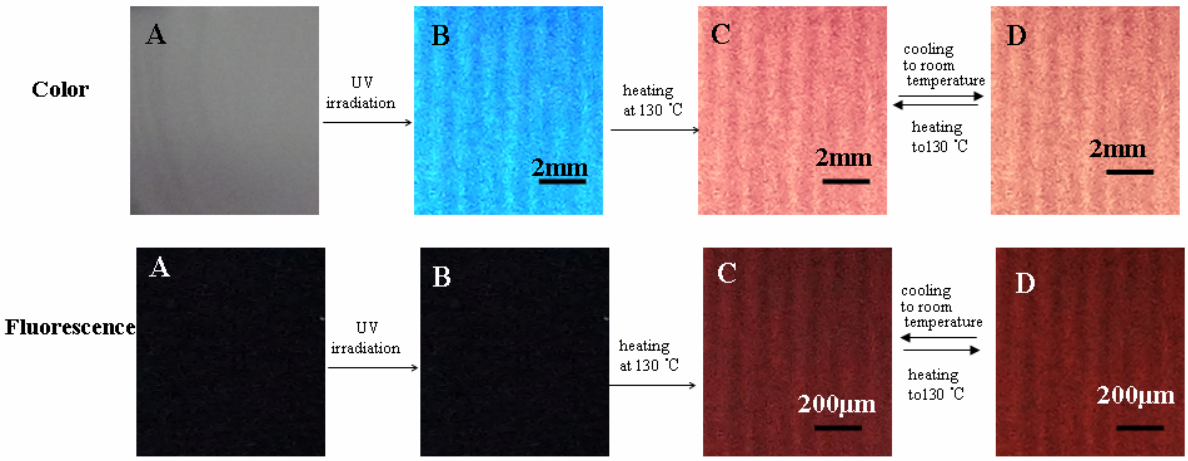

Figure S2. Patterned film of the physical mixture sample (DA and LDH) induced by UV irradiation and its thermochromic behavior (top: 500 μm wide line) and fluorescence transition (below: 50 μm wide line): (A) the physical mixture (DA and LDH) film, (B) the patterned film obtained by UV irradiating (A) for 5 min, (C) the patterned film by heating (B) at 130 °C for 1 min and (D) the patterned film by cooling (C) to room temperature.

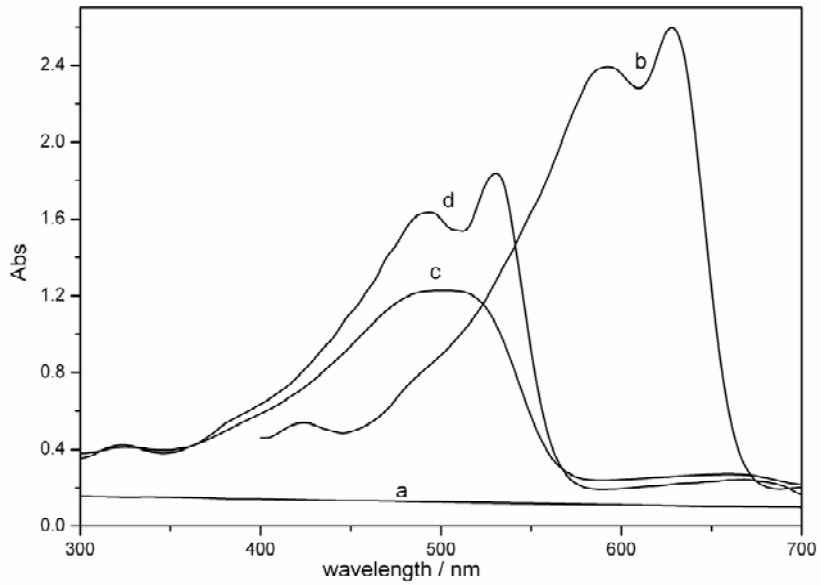

Figure S3. UV-vis absorption spectra of (a) the DA/LDH thin film before UV irradiation, (b) the PDA/LDH thin film obtained by UV irradiation, (c) heating (b) at 130 °C, (d) cooling (c) to room temperature.

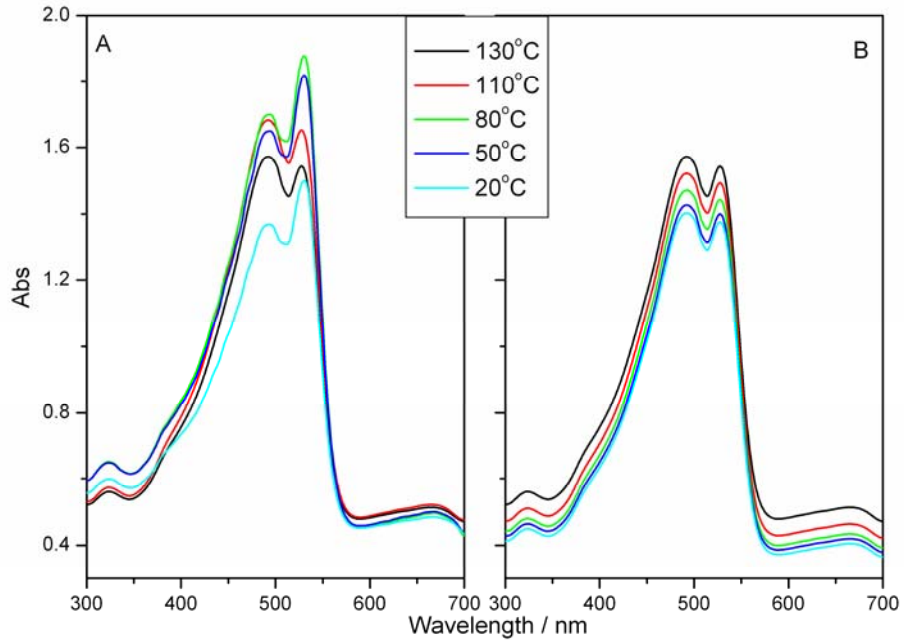

Figure S4. The *in situ* UV- vis absorption spectra of the physical mixture sample film (PDA and LDH) in a (A) heating and (B) cooling cycle in the temperature range 20–130 °C.

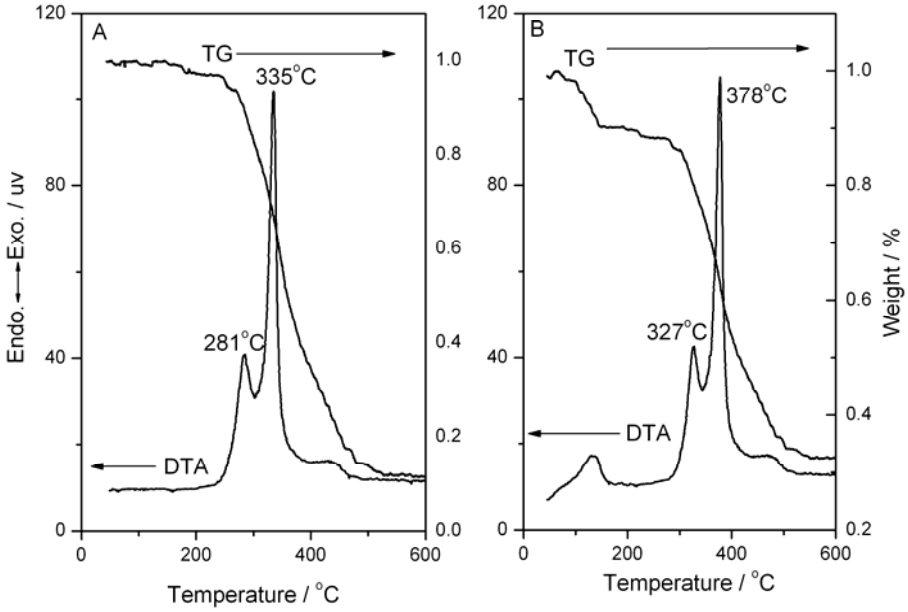

Figure S5. TG-DTA curves of (A) pristine PDA and (B) the PDA/LDH sample.

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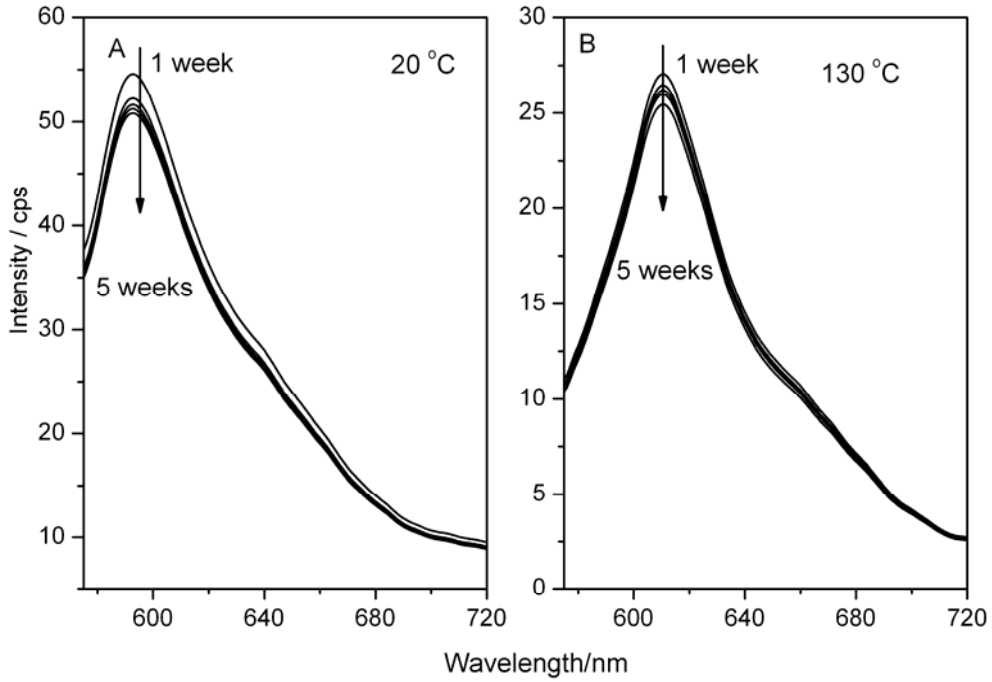

Figure S6. The fluorescence emission spectra of the PDA/LDH thin film recorded weekly at (A) 20 °C and (B) 130°C.

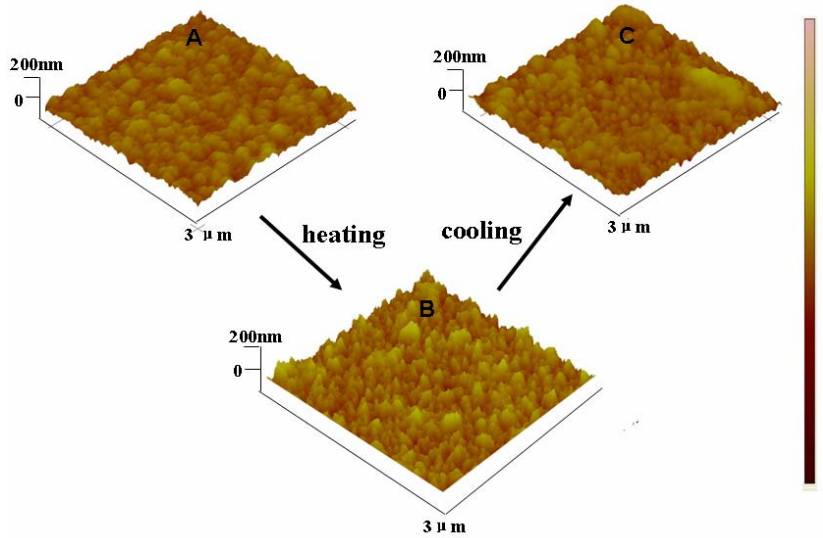

Figure S7. AFM images of the PDA/LDH film: (A) at 20°C, (B) heating (A) to 130 °C, (C) cooling (B) to 20 °C.

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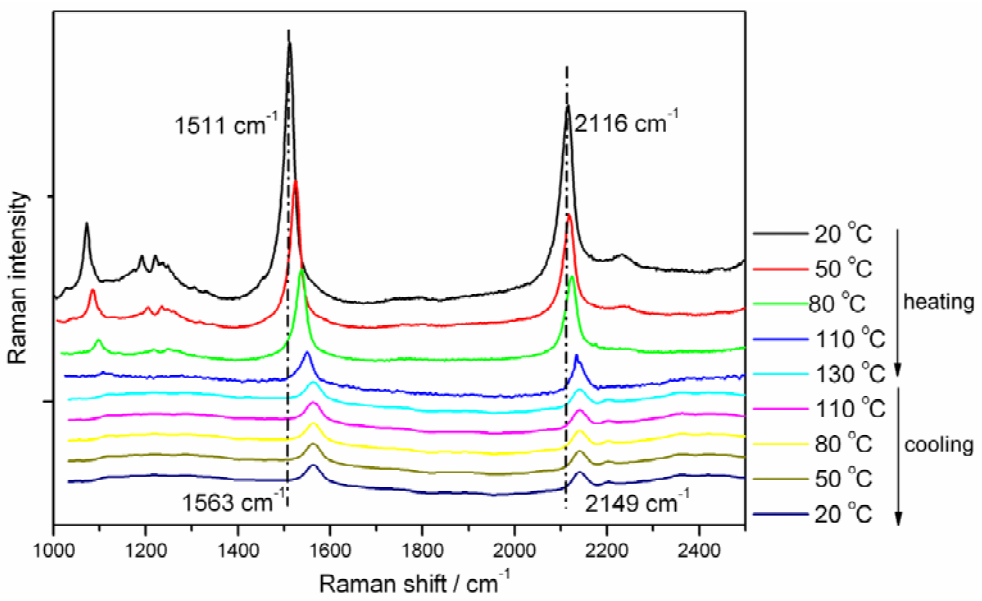

Figure S8. The *in situ* Raman spectra of the mixture sample (PDA and LDH) in a whole temperature cycle.

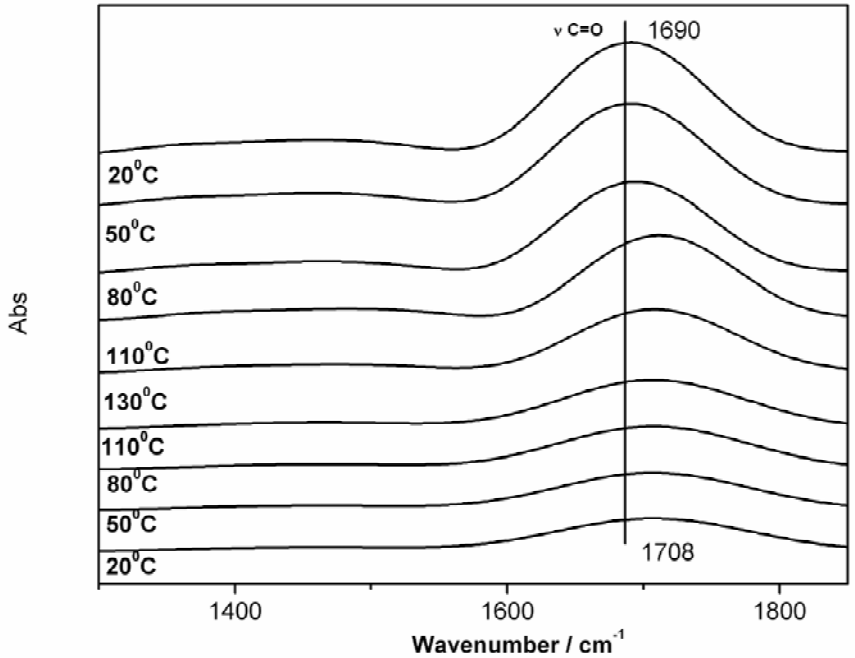

Figure S9. The *in situ* ATR FT-IR spectra of the pristine PDA film in a whole temperature cycle.