Supporting Information

For

Micro-patterned Photoalignment of $CsPbBr_3$ Nanowires with Liquid Crystal Molecules Composite Film for Polarized Emission

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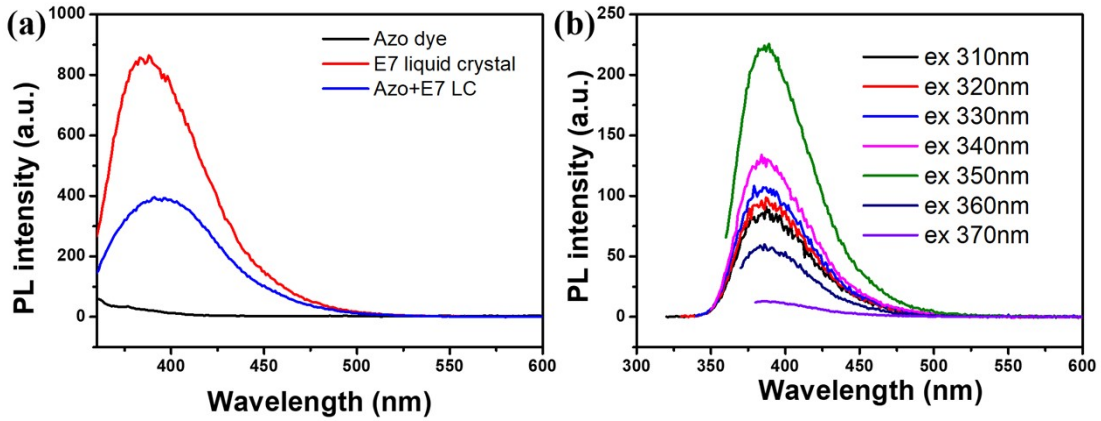

Fig S1 (a) PL spectra of azo dye film, E7 liquid crystal film and azo dye with E7 LC film. (b) PL spectra of E7 liquid crystal film under 310-370nm excitation light.

In order to find out why the $CsPbBr_3$ NWs film with LC show strong emission at 373nm, further PL tests are conducted. As is shown in fig S1(a), the film containing E7 liquid crystal shows strong emission at about 380nm. We guess that it is light scattering that result in the strong emission or the E7 LC itself gives out the ultraviolet light. In order to verify the guesses, PL spectra of E7 liquid crystal film under 310-370nm excitation light is shown in fig S1(b). If the 380nm emission results from light scattering, the emission peak will vary by the excitation light. As we can see in the fig S1(b), when the excitation light varies from 310nm to 370nm, the peak of emission light keeps unchanged. Thus, we can conclude that the E7 liquid crystal itself can give out light at 380nm. The E7 liquid crystal is one kind of liquid crystal conjugated polymer (LCCP) material, which is a novel functional material with liquid crystal and luminescence properties.[1] Since the emission light from E7 liquid crystal is ultraviolet, it makes little difference to the luminous properties of the device.

(1) Le Roux, F.; Taylor, R. A.; Bradley, D. D. C., *ACS Photonics* 2020, **7 (3)**, 746-758.