Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C.

A three-state label programmed from a three-color microsphere of structural, fluorescent and dye colors

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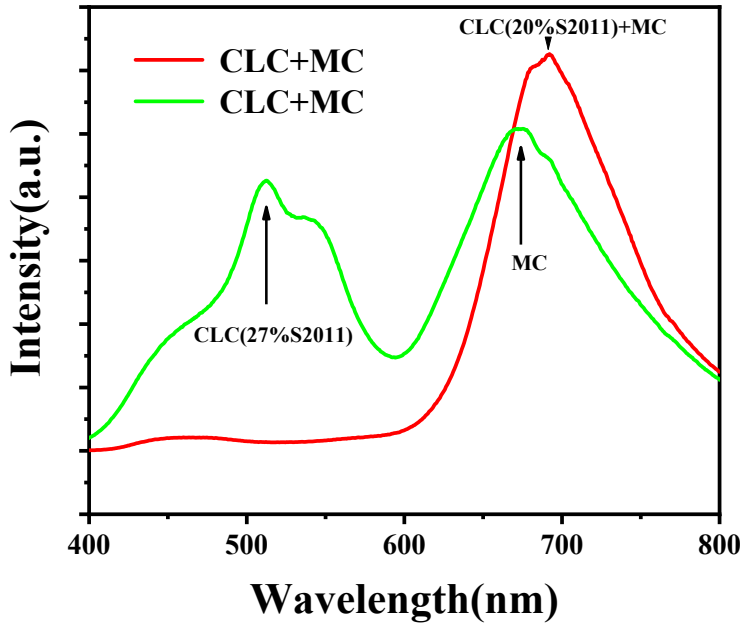

Figure.S1. The spectra of CLC doped with MC under the removal of UV state are shown. The green line segment represents the CLC with green structural color, and the red line segment represents the CLC with red structural color.

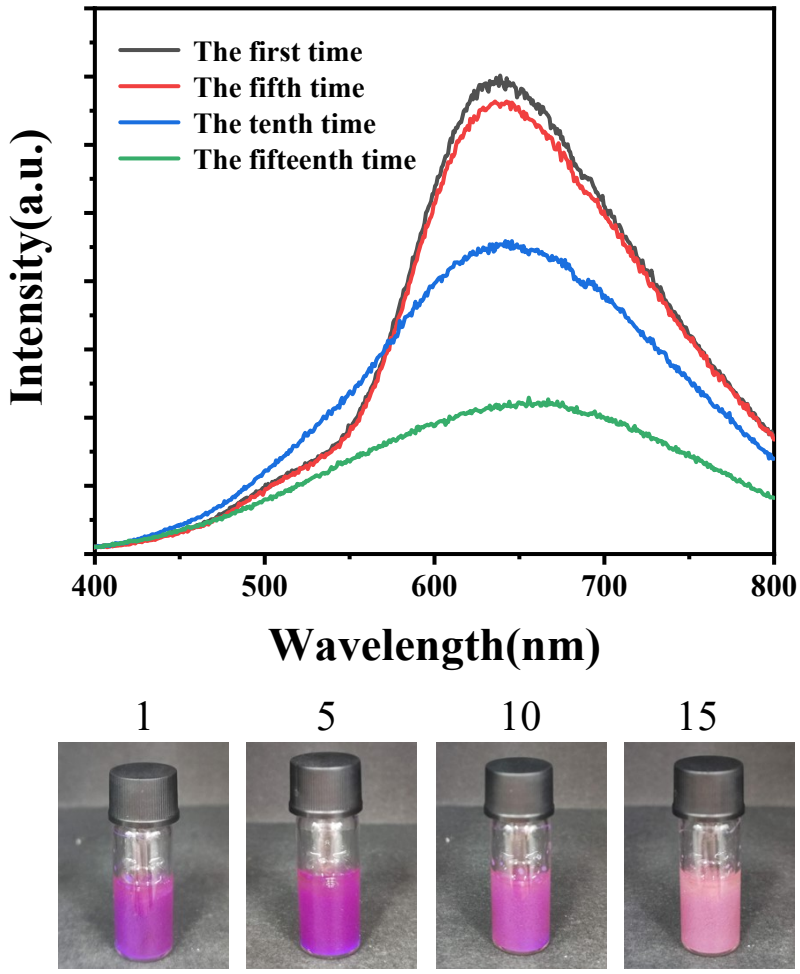

Figure.S2. Repeatability of three-state inks. The spectral graph displays the intensity of the photoluminescence peak of the MC for 1, 5, 10, and 15 cycles of three-state transition. The physical image demonstrates the dye color intensity of the three-state ink after 1, 5, 10, and 15 cycles of three-state transition.

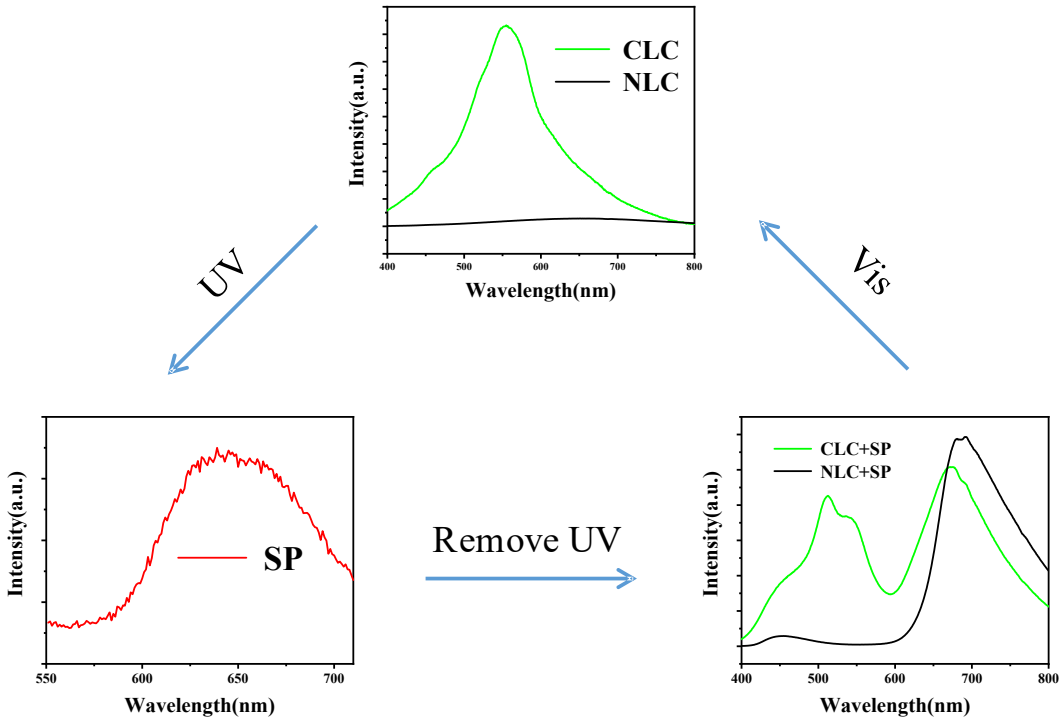

Figure.S3. Reflectance spectra of Images.The CLC exhibits a distinct reflection peak under visible light irradiation, while the SP emits fluorescence under UV light irradiation. Both the reflection peak of the CLC and the photoluminescence peak of the MC can be observed when the UV light is removed.