

Supporting Information

Realizing Nondestructive Luminescence Readout in Photochromic Ceramics via Deep Ultraviolet Excitation for Optical Information Storage

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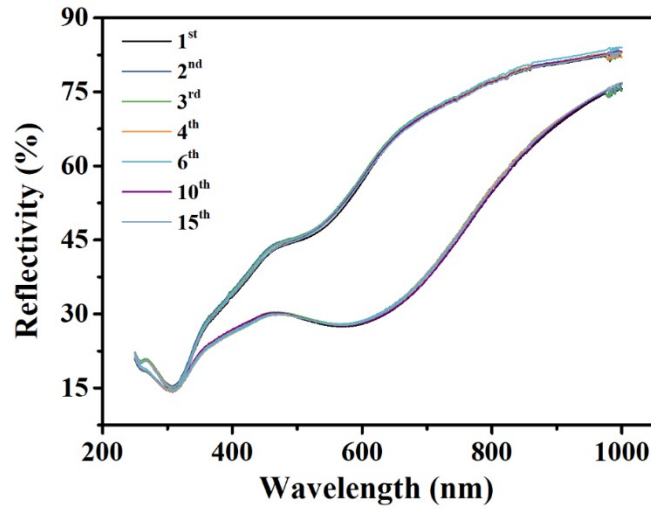


Figure S1. Reflectivity of $\text{Ca}_2\text{SnO}_4:\text{Eu}$ ceramics upon alternating 280 nm and 585 nm illumination for different cycles, and the illumination time for 280 nm and 585 nm is 2 min and 5 min, respectively.

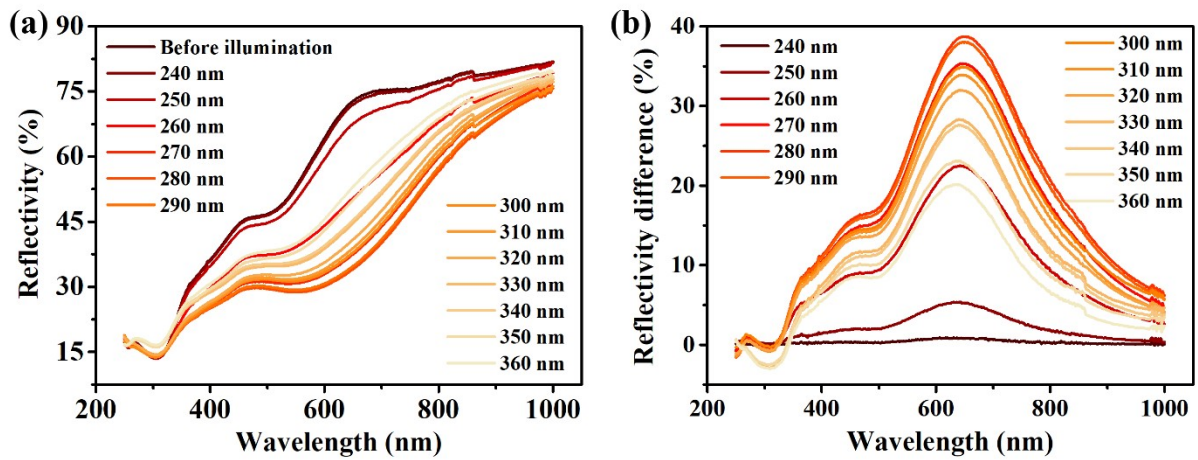


Figure S2. (a) Reflectivity of $\text{Ca}_2\text{SnO}_4:\text{Eu}$ ceramics after illumination with different wavelengths. (b) Reflectivity difference of $\text{Ca}_2\text{SnO}_4:\text{Eu}$ ceramics after illumination with different wavelengths. The illumination time of different wavelengths varies from 2 min to 5 min to ensure the sample reaches the maximum colored state.

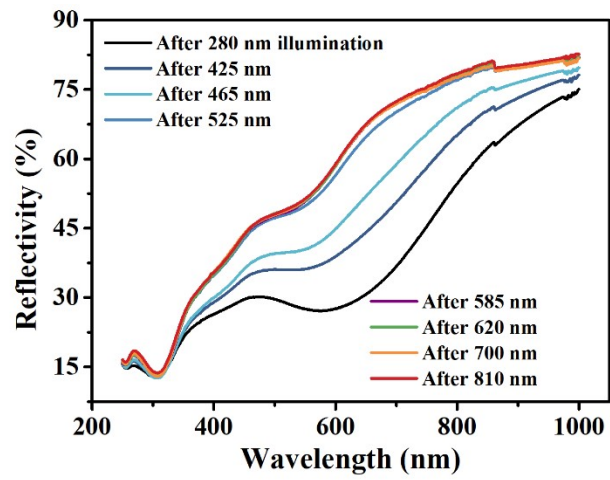


Figure S3. Wavelength-dependent bleaching behavior of $\text{Ca}_2\text{SnO}_4:\text{Eu}$ ceramics. With the illumination wavelengths increase, the illumination time increases from 5 min to 30 min to ensure the sample reaches the maximum bleaching state.

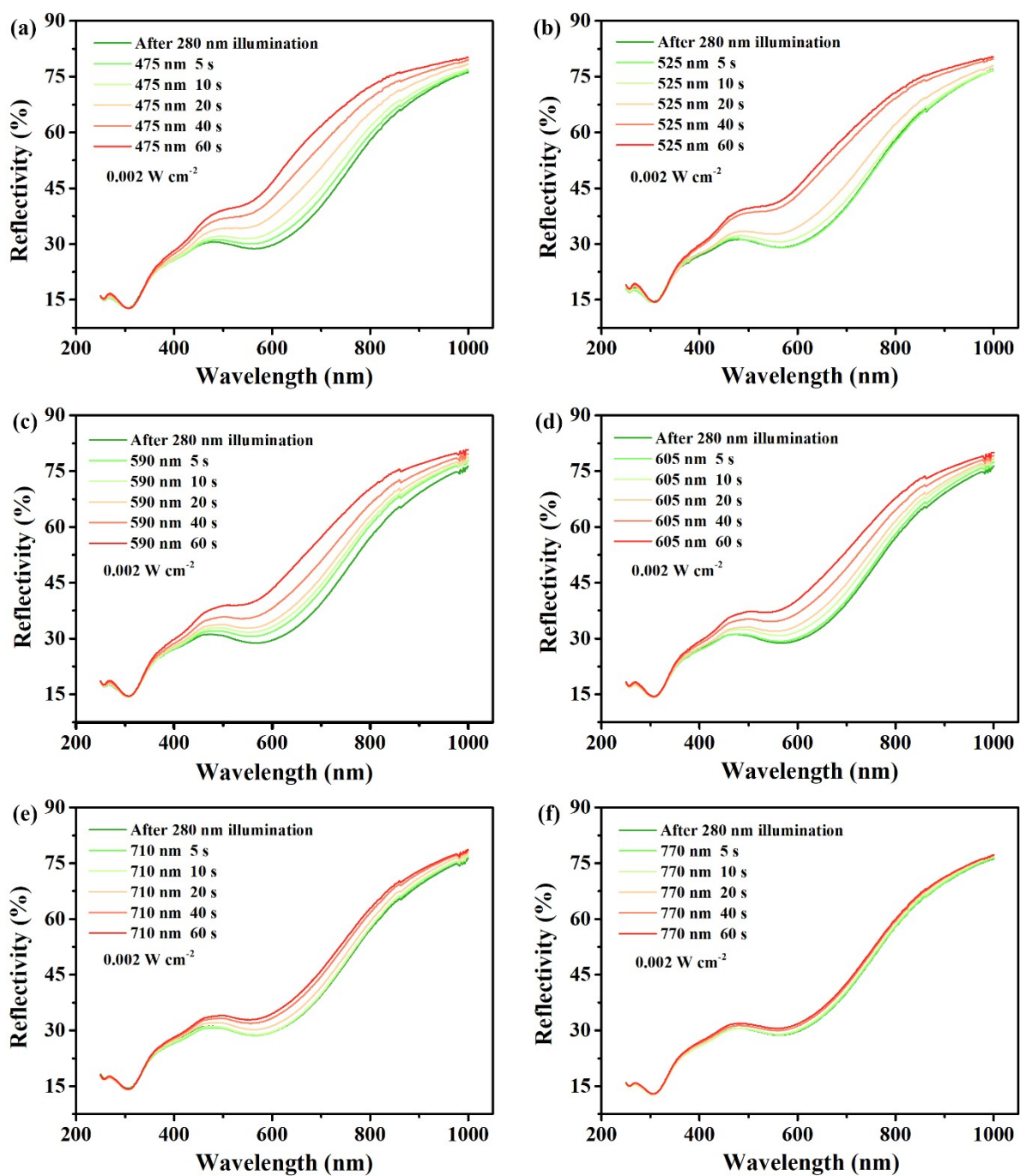


Figure S4. The bleaching processes of colored $\text{Ca}_2\text{SnO}_4:\text{Eu}$ ceramics under different wavelengths illumination with the same power density (a) 475 nm, (b) 525 nm, (c) 590 nm (d) 605 nm, (e) 710 nm and (f) 770 nm.

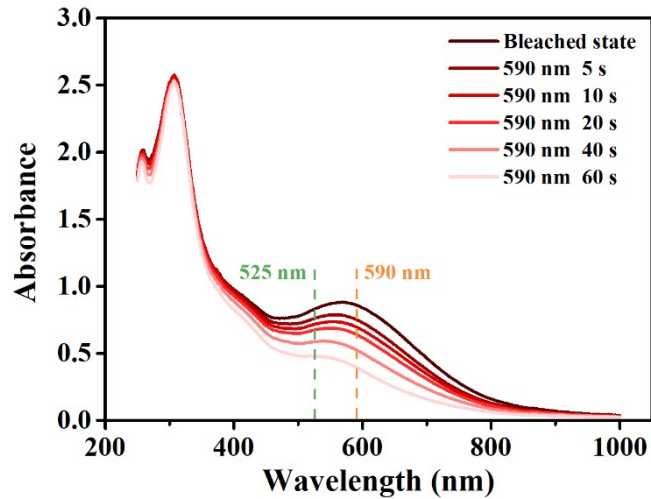


Figure S5. Absorption spectrum of $\text{Ca}_2\text{SnO}_4:\text{Eu}$ ceramics after 590 nm bleaching for different durations.

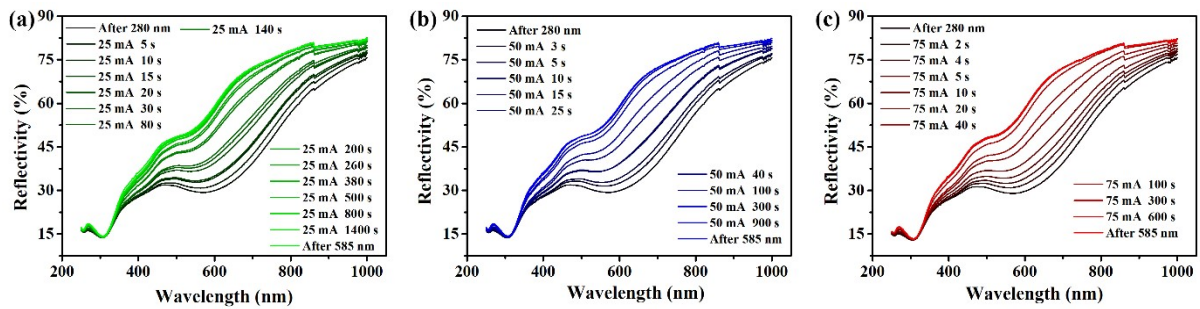


Figure S6. Power-dependent bleaching behavior of $\text{Ca}_2\text{SnO}_4:\text{Eu}$ ceramics upon 620 nm illumination at (a) 0.006 W cm^{-2} , (b) 0.013 W cm^{-2} and (c) 0.021 W cm^{-2} .

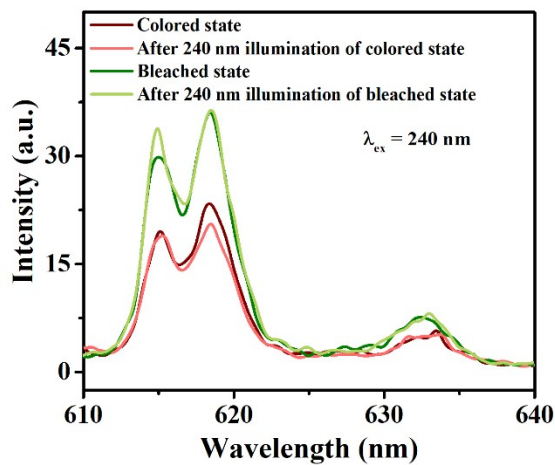


Figure S7. PL ($\lambda_{\text{ex}}=240 \text{ nm}$) spectra of $\text{Ca}_2\text{SnO}_4:\text{Eu}$ ceramics at room temperature in colored state, after 240 nm illumination of colored state, in bleached state and after 240 nm illumination

of bleached state with a illumination time of 2 min.

Table S1. The required time to reach a specific absorbance difference at 664 nm upon 620 nm illumination with different power density.

Absorbance difference	Required time for 0.006 W cm ⁻²	Required time for 0.013 W cm ⁻²	Required time for 0.021 W cm ⁻²
0.125	6.9 s	3.4 s	2.45 s
0.15	8.8 s	4.27 s	3.06 s
0.2	14.02 s	6.01 s	4.27 s
0.25	17.3 s	8.01 s	5.8 s