

Supporting information for

Trap-Controlled Sodalites with High Photochromic Contrast for Decoloration Applications

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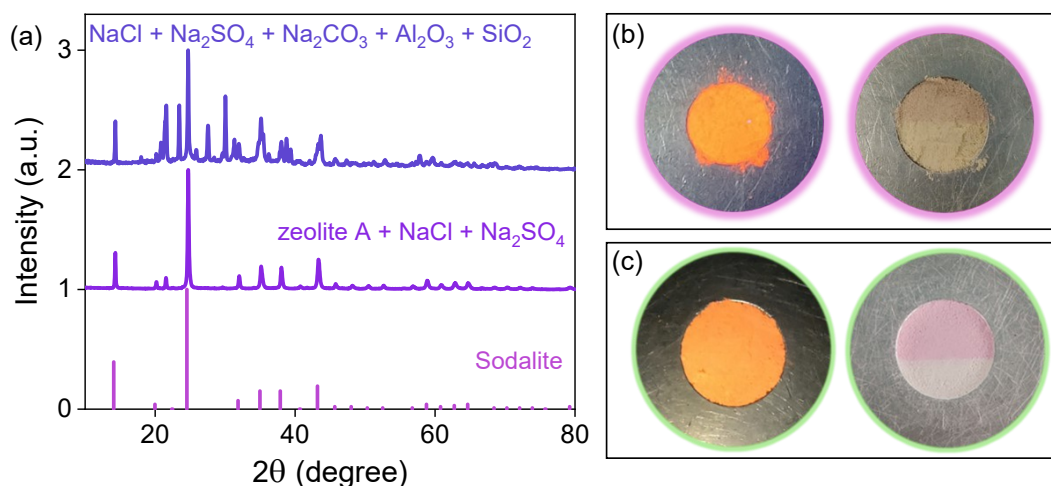


Figure S1. (a) XRD patterns of synthesized $\text{Na}_8(\text{AlSiO}_4)_6\text{Cl}_2$ by microwave-assisted solid-state (MASS) reactions using different precursors. (b) Photographs of synthesized $\text{Na}_8(\text{AlSiO}_4)_6\text{Cl}_2$ using NaCl , Na_2SO_4 , Na_2CO_3 , Al_2O_3 and SiO_2 as precursors under 365 nm illumination (left) and after 254 nm coloring (right). (c) Photographs of synthesized $\text{Na}_8(\text{AlSiO}_4)_6\text{Cl}_2$ using zeolite A, NaCl and Na_2SO_4 as precursors under 365 nm illumination (left) and after 254 nm coloring (right).

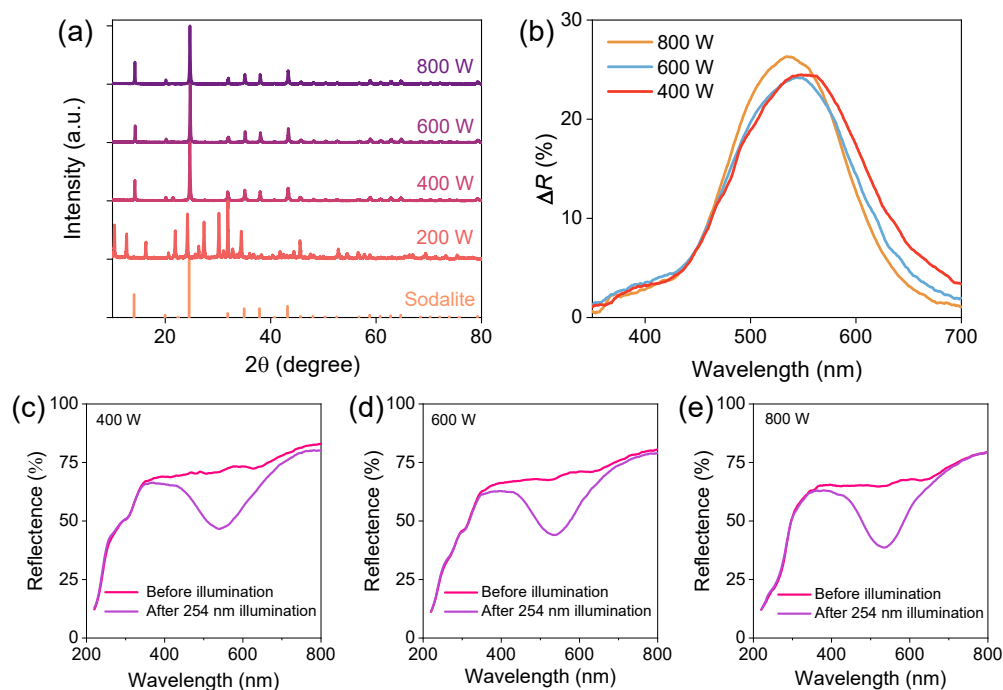


Figure S2. (a) XRD patterns of $\text{Na}_8(\text{AlSiO}_4)_6\text{Cl}_2$ synthesized by MASS reactions using different power levels. (b) Reflectivity difference of $\text{Na}_8(\text{AlSiO}_4)_6\text{Cl}_2$ synthesized with different power levels before and after 254 nm illumination. Reflectivity spectra of

$\text{Na}_8(\text{AlSiO}_4)_6\text{Cl}_2$ synthesized using (c) 400 W, (d) 600 W, and (e) 800 W before and after 254 nm illumination.

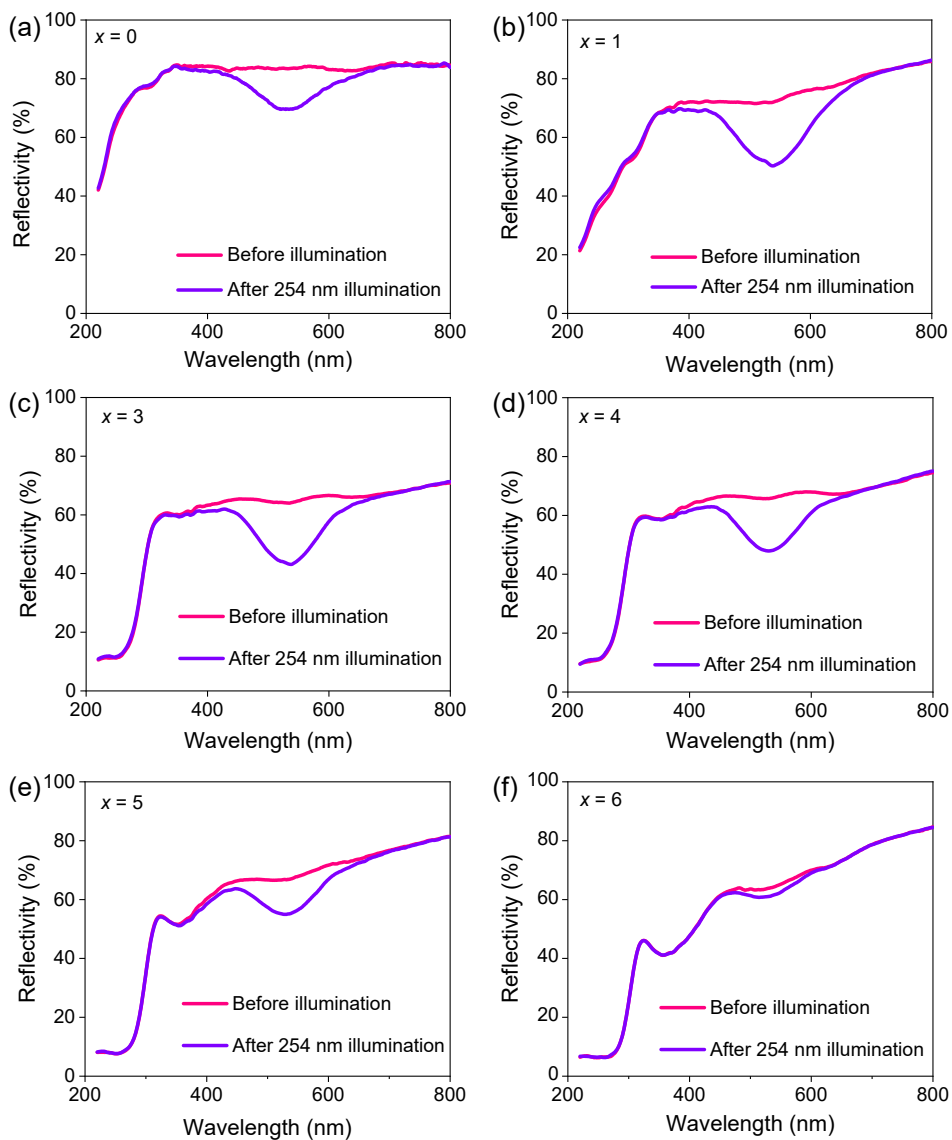


Figure S3. Reflectivity spectra of $\text{Na}_8(\text{AlSiO}_4)_6\text{Cl}_{2-0.3x}\text{S}_{0.15x}$ synthesized by MASS reactions before and after 254 nm illumination with (a) $x = 0$, (b) $x = 1$, (c) $x = 3$, (d) $x = 4$, (e) $x = 5$, and (f) $x = 6$.

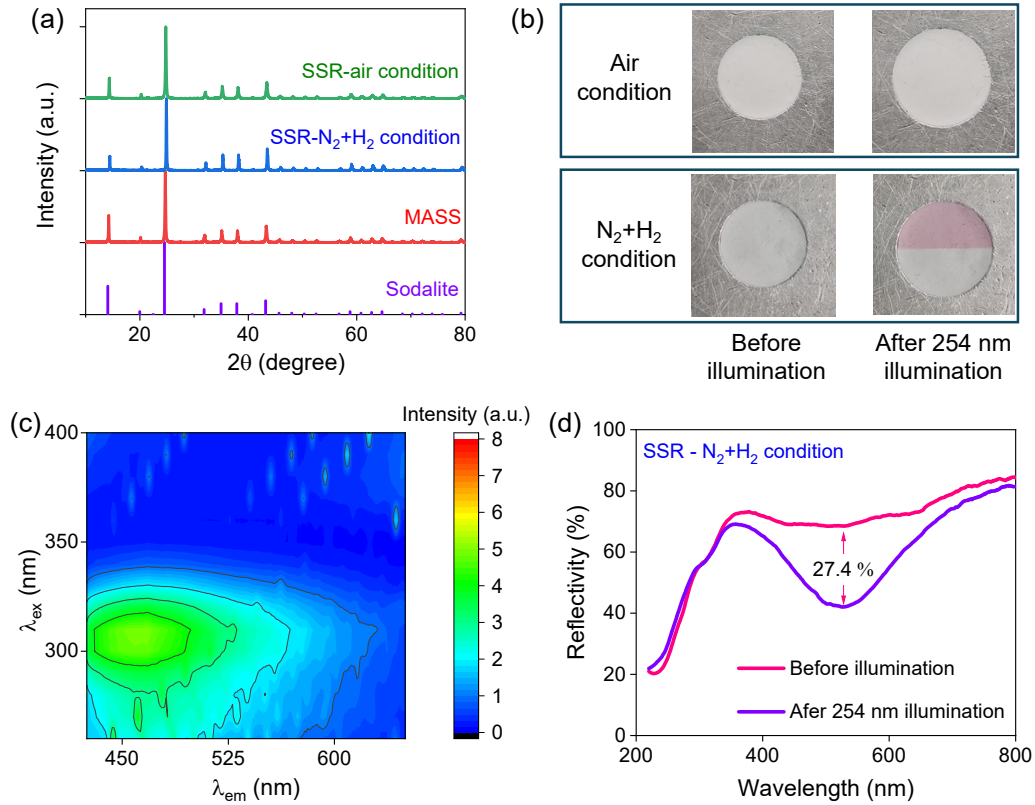


Figure S4. (a) XRD patterns of $\text{Na}_8(\text{AlSiO}_4)_6\text{Cl}_{1.4}\text{S}_{0.3}$ synthesized by different methods. (b) Photographs of $\text{Na}_8(\text{AlSiO}_4)_6\text{Cl}_{1.4}\text{S}_{0.3}$ synthesized by solid-state reactions (SSR) in different conditions before and after 254 nm illumination. (c) Contour plot of the excitation-dependent photoluminescence emission spectra of $\text{Na}_8(\text{AlSiO}_4)_6\text{Cl}_{1.4}\text{S}_{0.3}$ synthesized by SSR in N_2+H_2 condition. (d) Reflectivity spectra of $\text{Na}_8(\text{AlSiO}_4)_6\text{Cl}_{1.4}\text{S}_{0.3}$ synthesized by SSR in N_2+H_2 condition before and after 254 nm illumination.

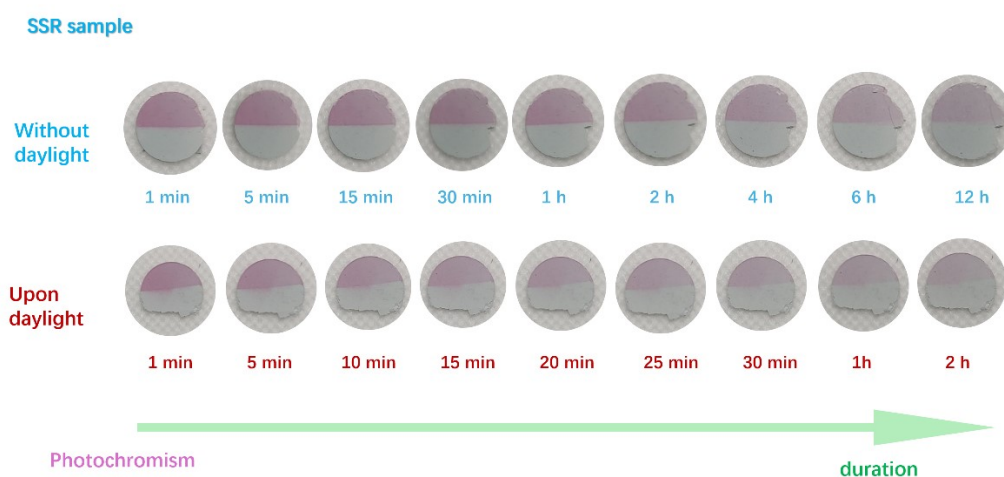


Figure S5. Stability of the photochromic sample ($\text{Na}_8(\text{AlSiO}_4)_6\text{Cl}_{1.4}\text{S}_{0.3}$) prepared by SSR method. Photochromic samples were put upon daylight or without daylight (in darkness) for varied durations at room temperature.

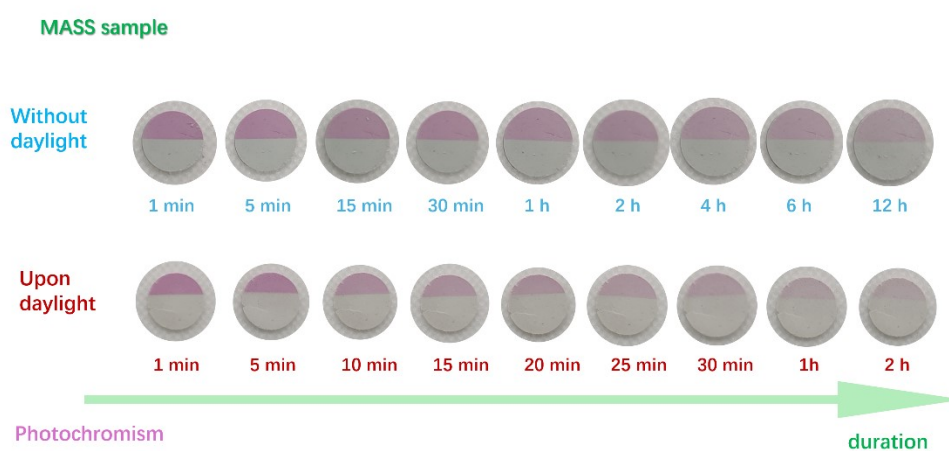


Figure S6. Stability of the photochromic sample ($\text{Na}_8(\text{AlSiO}_4)_6\text{Cl}_{1.4}\text{S}_{0.3}$) prepared by MASS method. Photochromic samples were put upon daylight or without daylight (in darkness) for varied durations at room temperature.