Electronic Supplementary Information (ESI) for

Revealable photonic prints with oppositely responsive polymers for improved visual sensing

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Supplementary Figures:

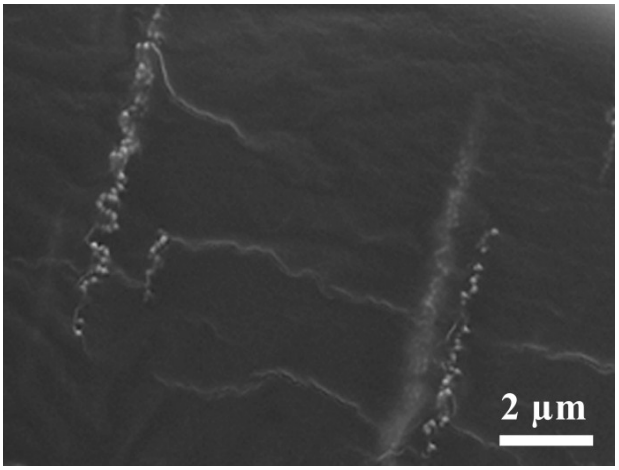

Fig. S1 Cross-sectional SEM image of the dried PHEMA photonic hydrogel matrix. The sample was obtained by drying the PHEMA photonic hydrogel matrix in an oven at 60 ℃. Clearly, 1D chain-like structures of the self-assembled Fe_3O_4@C NPs embedded in the polymer network can be observed.

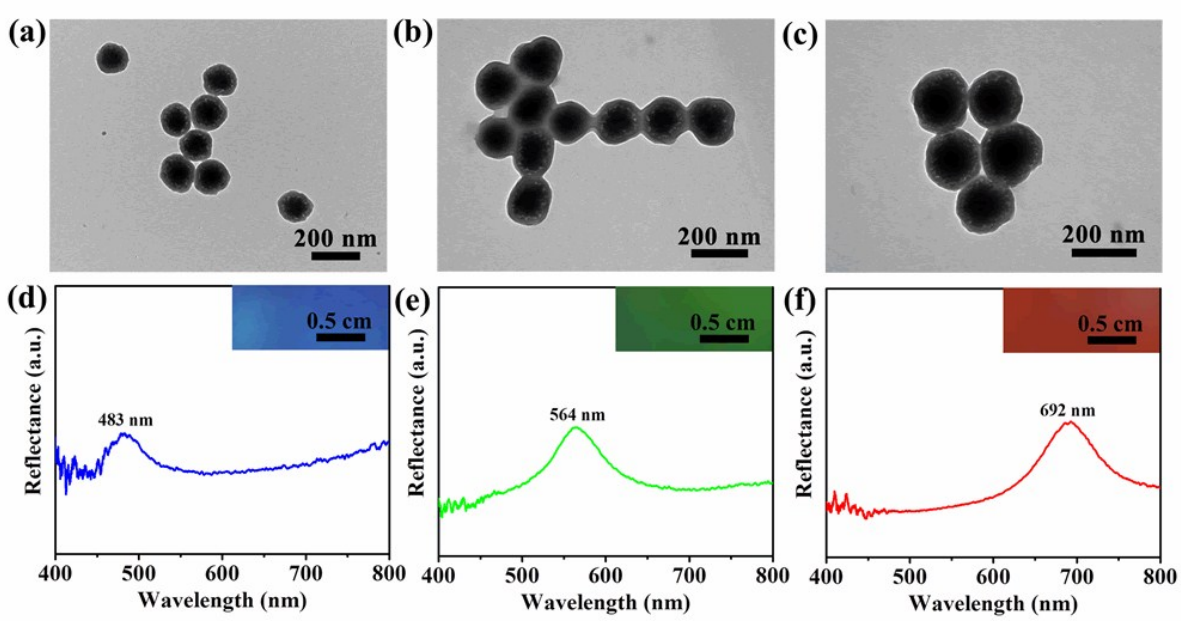

Fig. S2 (a-c) TEM images of the Fe_3O_4@C NPs with the size of 110 nm, 150 nm, and 190 nm; (d-f) Reflection spectra of the photonic hydrogel films prepared from different sizes of Fe_3O_4@C NPs: 110 nm (d); 150 nm (e); and 190 nm (f). Insets are the photographs of the photonic hydrogel films.

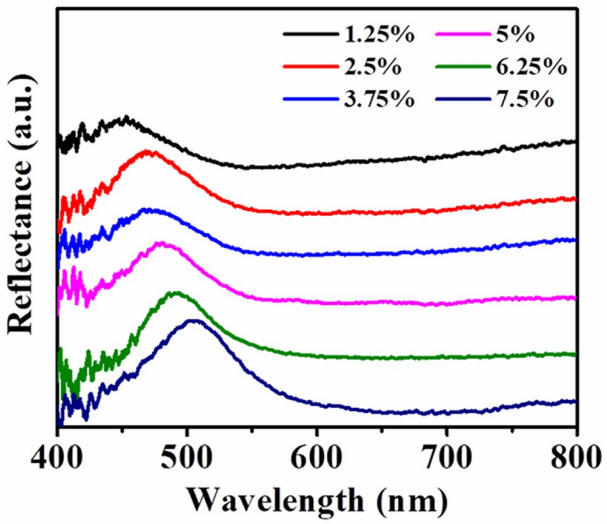

Fig. S3 Reflection spectra of PHEMA photonic hydrogel films with different cross-linking densities. With the increase of crosslinking degree, the position of the reflection peak (λ_{max}) of the photonic hydrogel films shifts from 453 nm to 505 nm.

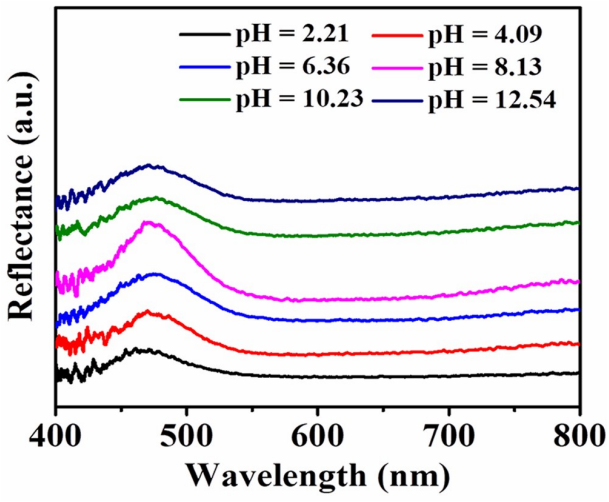

Fig. S4 Reflection spectra of the PHEMA photonic hydrogel films in different pH solutions. After being immersed in different pH solutions for 10 min, the reflection peak (λ_{max}) remained at 472 nm, indicating that PHEMA photonic hydrogel film is insensitive to pH change.

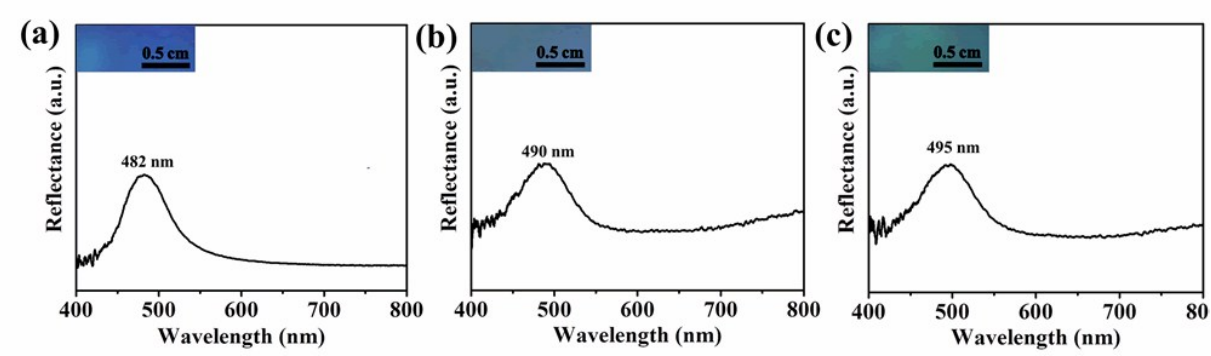

Fig. S5 Reflection spectra of the photonic hydrogel films prepared from (a) PHEMA; (b) PHEMA-PAA; (c) PHEMA-PDMAEMA. Insets are the photographs of the photonic hydrogel films.

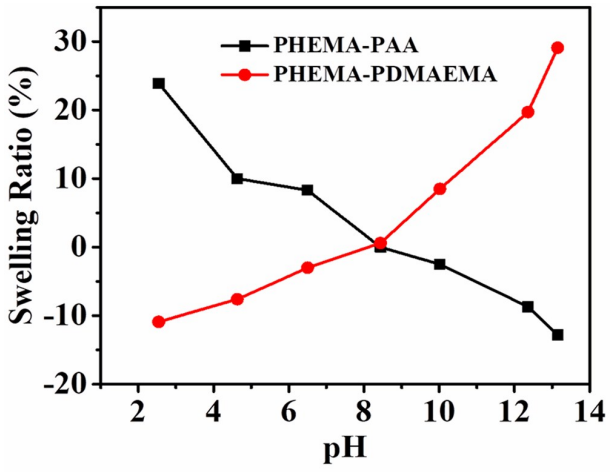

Fig. S6 Swelling ratio of the PHEMA-PAA and PHEMA-PDMAEMA photonic hydrogel films in different pH solutions. After being immersed in different pH solutions for 10 min, the photonic hydrogel films were measured after removing excess surface water using filter paper.

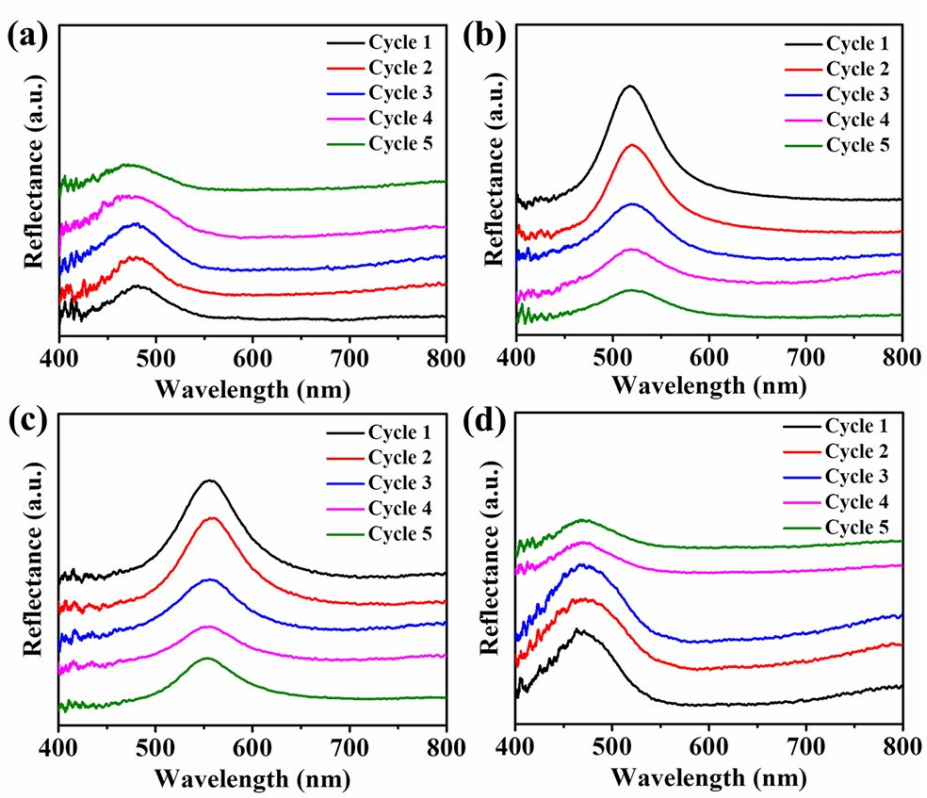

Fig. S7 Reflection spectra of (a) PHEMA-PAA in the intermediate region and (b) PHEMA-PDMAEMA in the surrounding region after being immersed into the solution at pH = 5.32 in each cycle; Reflection spectra of (c) PHEMA-PAA in the intermediate region and (d) PHEMA-PDMAEMA in the surrounding region after being immersed into the solution at pH = 11.22 in each cycle.