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Two-Way Rewritable and Stable Photonic Patterns Enabled by Near-Infrared Laser Responsive Shape Memory Photonic Crystals

Pingnan Chang, Wenbin Niu, Lingcheng Qu, and Shufen Zhang*

State Key Laboratory of Fine Chemicals, Dalian University of Technology, West Campus, 2# Linggong Rd., Dalian 116024, China.

*E-mail: niuwb@dlut.edu.cn

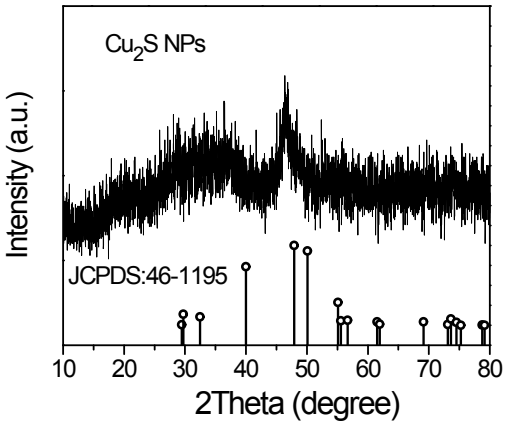

Fig. S1 X-ray diffraction (XRD) pattern of Cu_2S nanoparticles.

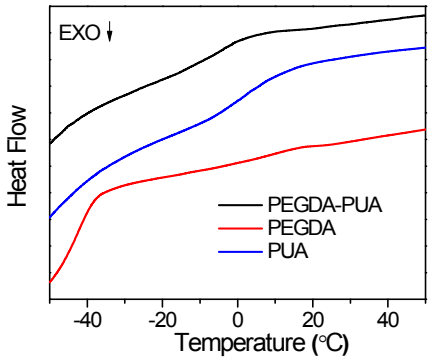

Fig. S2 DSC plots of PUA, PEGDA, and PEGDA-PUA copolymers.

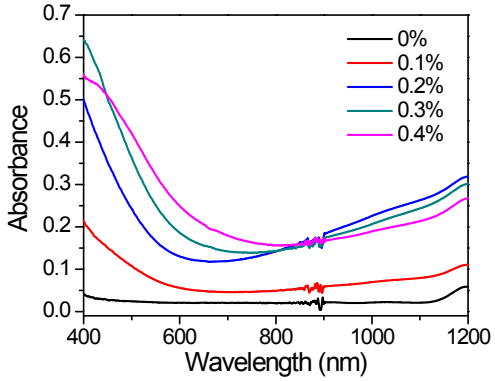

Fig. S3 Visible-infrared absorbance spectra of PEGDA-PUA membranes with different concentration of Cu_2S nanoparticle.

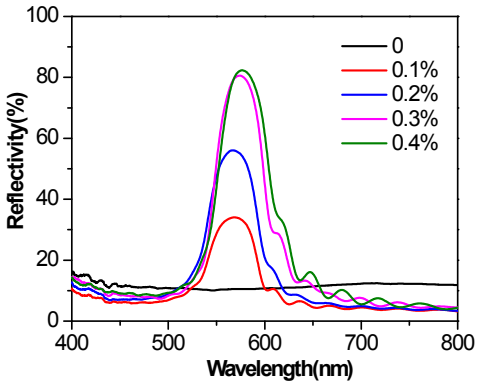

Fig. S4 Reflective spectra of SMPCs with different Cu_2S doping concentrations (wt%) upon exposure to a 980 nm laser (power density of 5.0 W·cm^{-2}) for 3s.

Tab. S1 Core temperature of Cu_2S doped SMPCs exposed to 980 nm laser irradiation.

Laser power density/ W·cm^{-2}	Irradiation time/s	Core temperature/ ^{o}C
5.0	1.0	49
	2.0	52
	3.0	65
	4.0	72

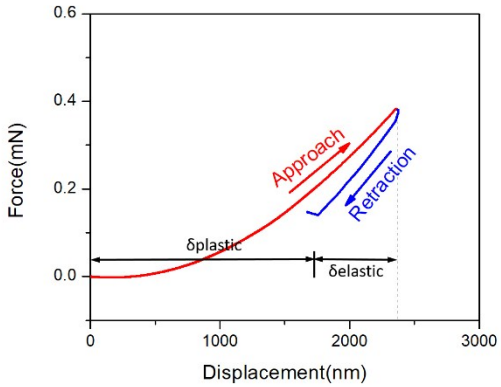

Fig. S5 Indentation force−displacement curves showing the approach and retraction segments obtained on indenting SMPCs.

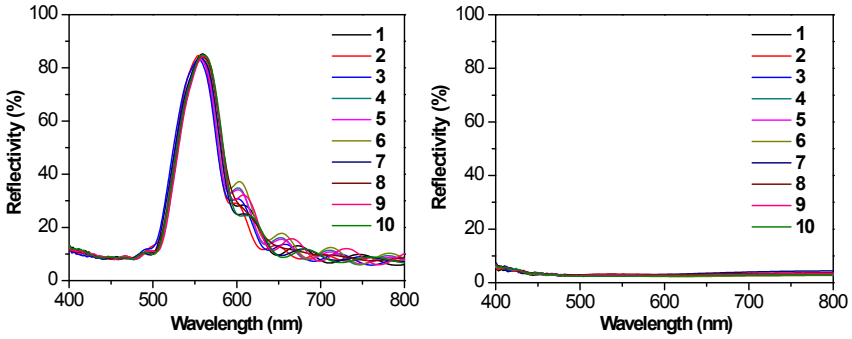

Fig. S6 Reflective spectra of Cu_2S-doped PEGDA-PUA SMPCs with 300 nm macropores cyclically (a) recovered and (b) deformed for ten times.

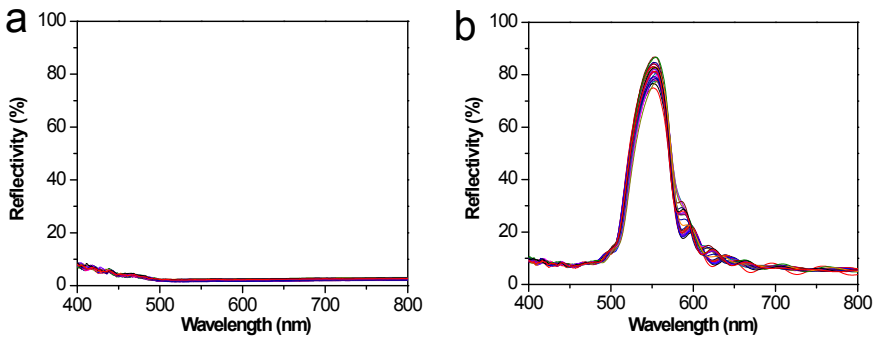

Fig. S7 Reflective spectra of (a) deformed and (b) recovered Cu_2S-doped PEGDA-PUA SMPCs in 30 days (measured once a day).

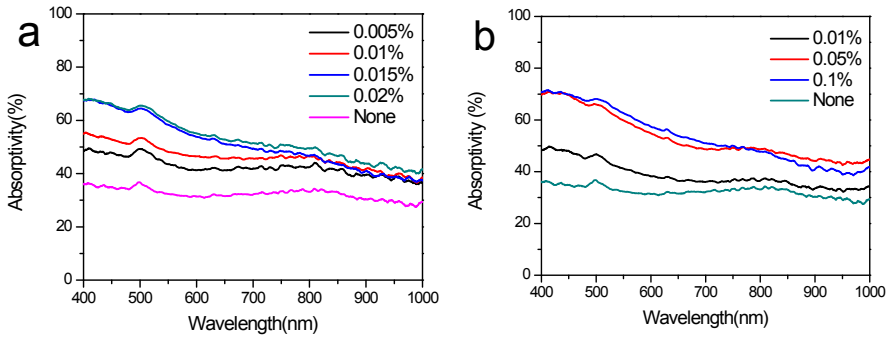

Fig. S8 Absorption spectra of SMPCs doped with various weight concentrations of (a) graphene oxide and (b) MoS_2 nanosheets.

Fig. S9 A series of patterns imprinted onto the identical Cu_2S-doped PEGDA-PUA SMPCs through repeated pressing/recovering processes.

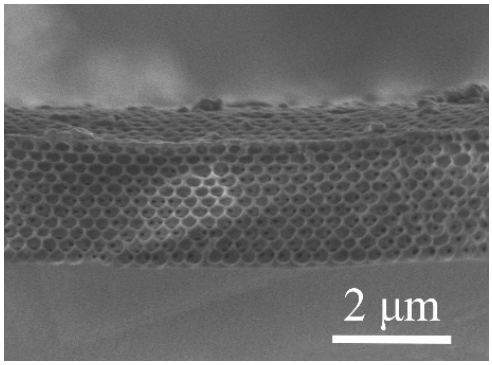

Fig. S10 Cross-sectional SEM images of the photonic crystal membranes of the recovered state upon exposing to 980 nm near-infrared laser.

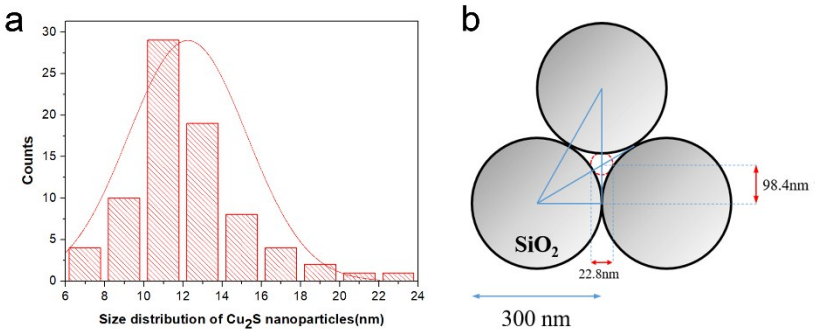

Fig.S11 (a) Histogram of Cu_2S nanoparticle size distribution (b) Closely packed model of SiO_2 opal photonic crystals.