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


Supporting Information

# Dual manipulation of light and shape based on nanoparticle-induced shape memory composites

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This PDF includes:

Fig. S1-Fig. S9

Captions for videos

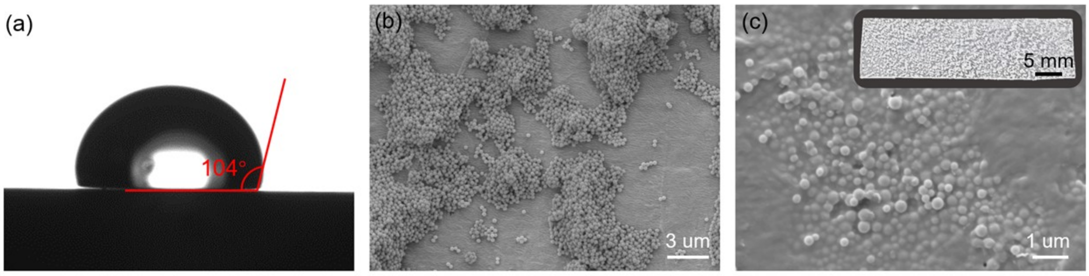


Fig. S1 (a) Water contact angle of PI substrate without fluorination. (b) $SiO_2$ NPs are left on PI substrate without fluorination. (c) SEM image and digital photo of complex film peeled off the un-fluorinated PI substrate.

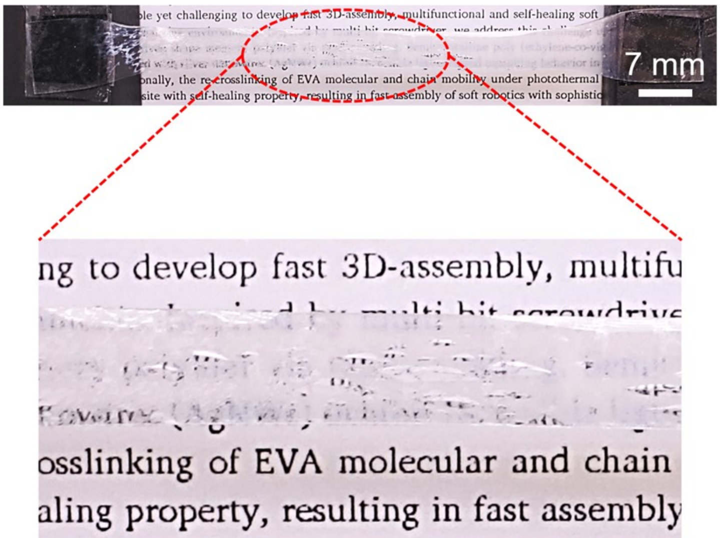


Fig. S2 An inhomogeneous composite film from the casting method.

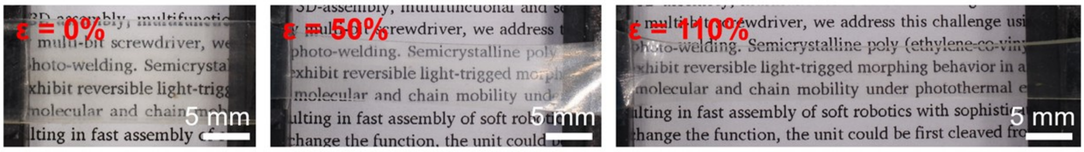


Fig. S3 Optical images of crosslinked EVA film without $SiO_2$ NPs at specific strains.

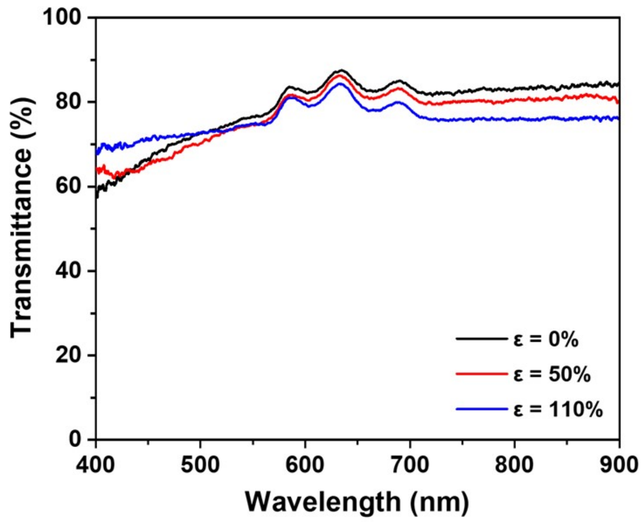


Fig. S4 Transmittance spectra of crosslinked EVA film without $SiO_2$ NPs upon stretching.

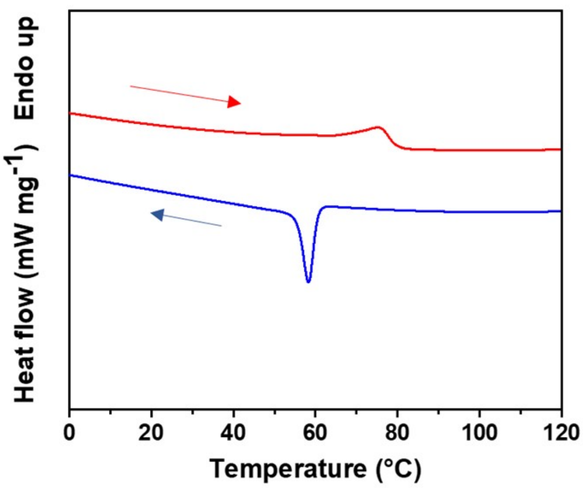


Fig. S5 DSC second heating and cooling curves of $SiO_2$/EVA composite films.

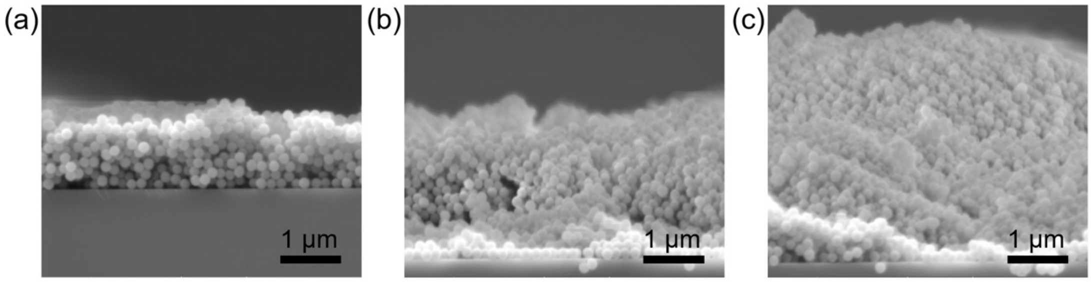


Fig. S6 Cross-sectional SEM images of $SiO_2$ layer with different spray times, (a) 10 times, (b) 30 times, (c) 50 times.

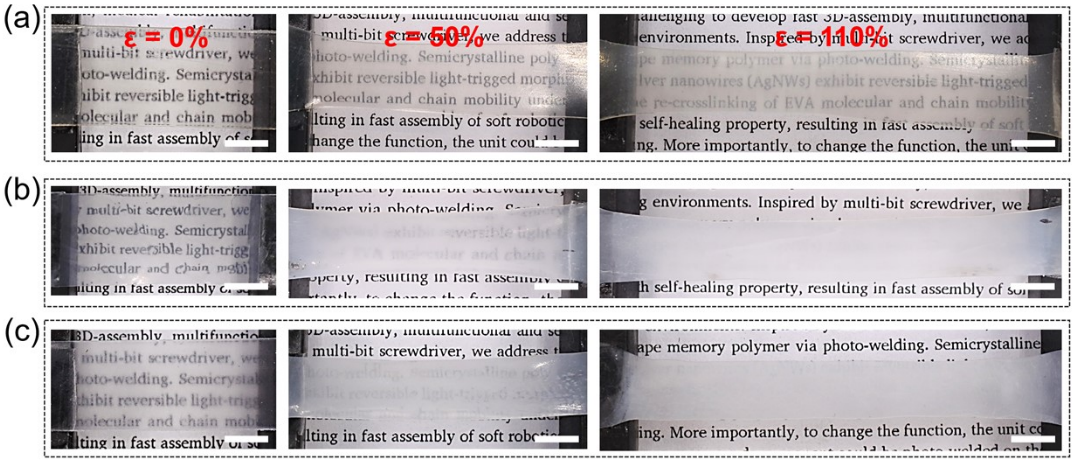


Fig. S7 Optical images of $SiO_2$/EVA composite films with different spray times, (a) 10 times, (b) 30 times, (c) 50 times at specific strains. Scale bar: 5 mm.

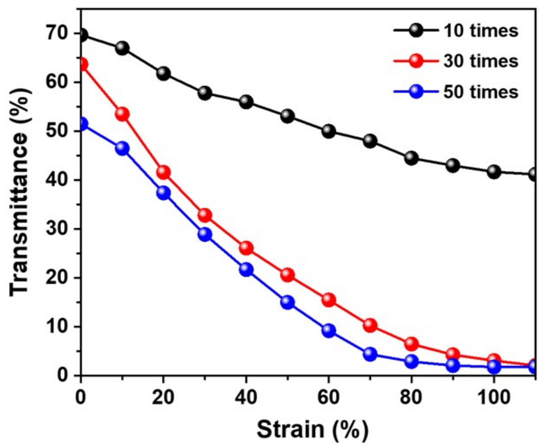


Fig. S8 Transmittance at wavelength of 750 nm of $SiO_2$/EVA composite films versus NPs spray times as a function of applied strain.

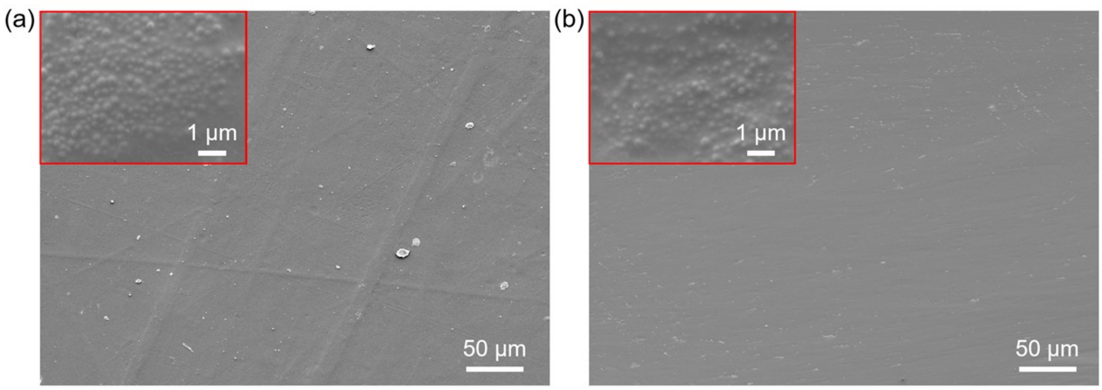


Fig. S9 SEM images of initial state of $SiO_2$/EVA composite films in Fig. 3d (a) and Fig. 3e (b).

Captions for supporting videos

Video S1 Light modulation with the deformation under stretching

Video S2 Reversible transmittance change via thermal-driven shape reconfiguration

Video S3 Demo of $SiO_2$/EVA composite films for high temperature warning circuits