Supporting Information

Multi-Shape-Memory Effects in Wavelength-Selective Multicomposites

Li Yu[a], Qian Wang[b], Jian Sun[a], Chenyue Li[a], Cheng Zou[a], Zemin He[a], Zhendong Wang[a], Le Zhou[a], Lanying Zhang[a] and Huai Yang*[a]
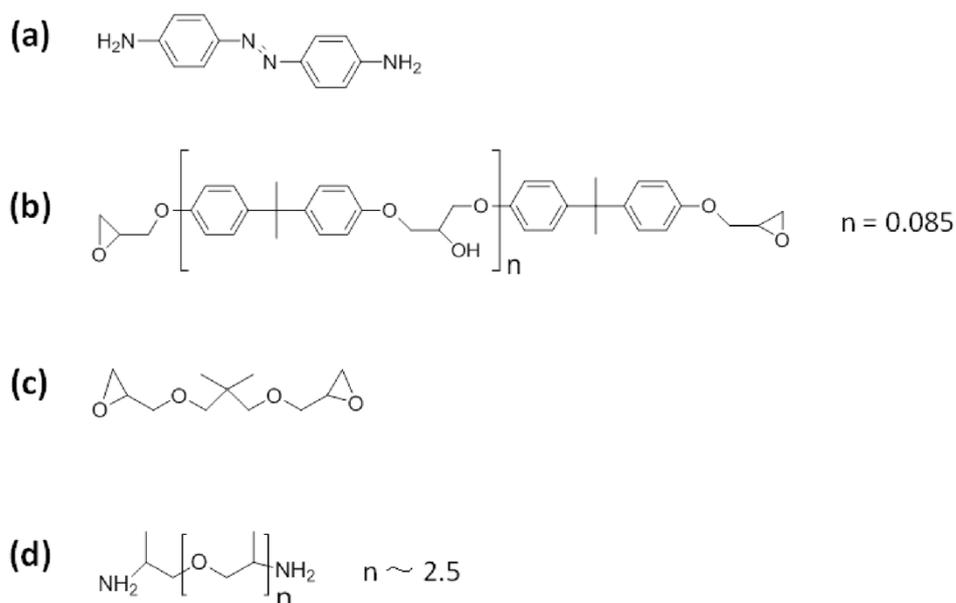
Figure S1. Chemical structures of (a) p-aminodiphenylimide. Epoxy precursors (b) diglycidyl ether of bisphenol A, (c) neopentyl glycol diglycidyl ether and (d) the curing agent.
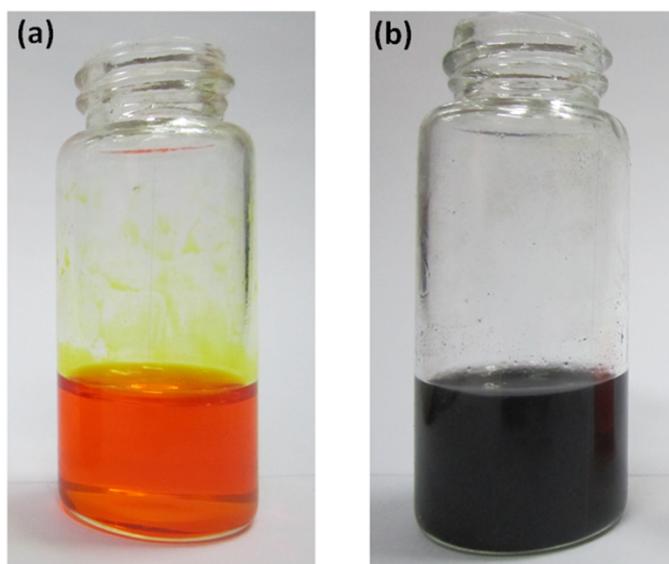
Figure S2. Dispersion of (a) p-Ap and (b) MWCNT in epoxy precursors.
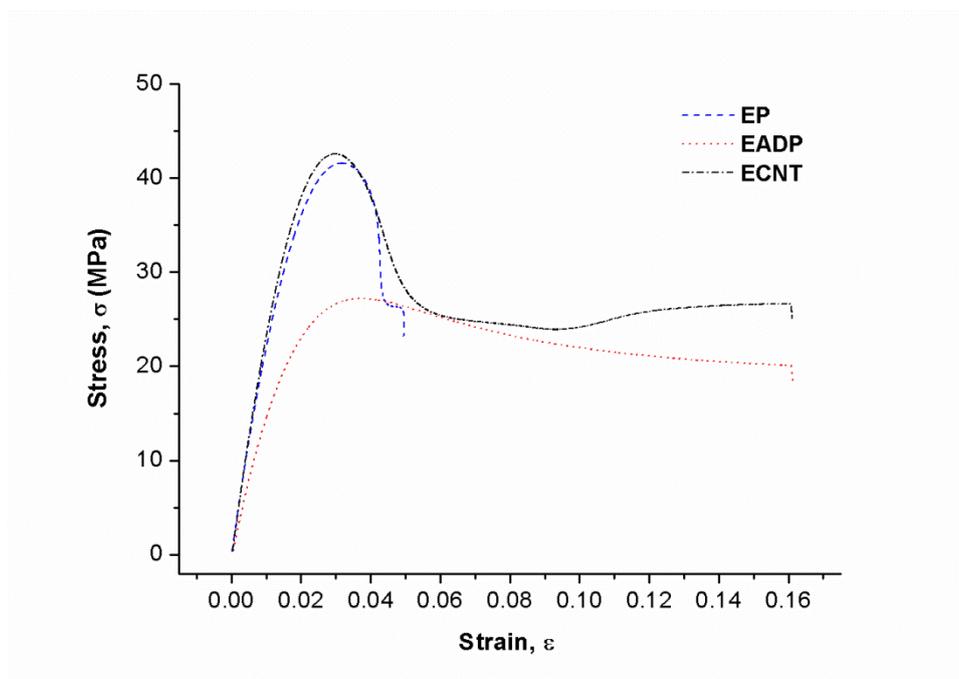
Figure S3. Mechanical properties of neat epoxy, p-Ap/epoxy and MWCNT/epoxy composites.
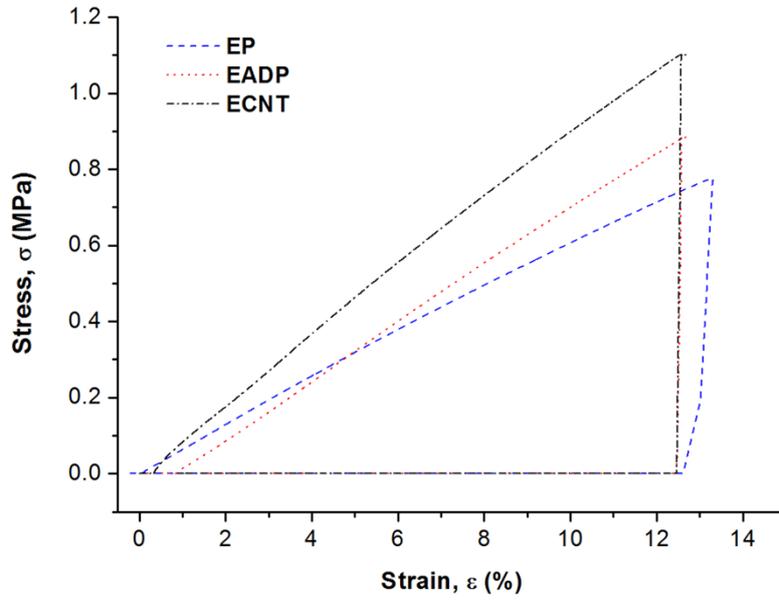
Figure S4 ε-σ curve of thermomechanical tensile tests for pure epoxy and epoxy composites.

The shape fixity ratio (R_f) and shape recovery ratio (R_r) were two important parameters to describe the dual-shape-memory effect. They were calculated as follows,

$$R_f = \frac{\varepsilon_{ul}}{\varepsilon_o} \times 100\%$$

$$R_r = \frac{\varepsilon_{ul} - \varepsilon_{rec}}{\varepsilon_{ul}} \times 100\%$$

where ε_0, ε_{ul} and ε_{rec} are the strains after the stretch, unloading and recovery, respectively.
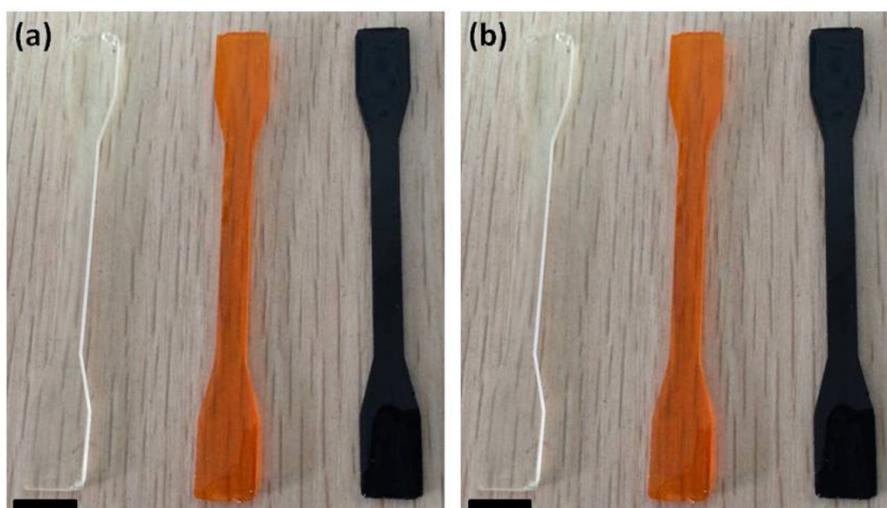
Figure S5. Aging experiment to evaluate the stability of neat epoxy and epoxy composites. Middle parts of all samples are before (a) and after (b) continuously irradiated under UV light with the light intensity of 270 mw/cm^2 for 100 h (laser illumination spot are 40 × 40 mm^2). Transparent, orange and black sample are neat epoxy, p-Ap/epoxy and MWCNT/epoxy composites, respectively. The scale bar is 5mm.
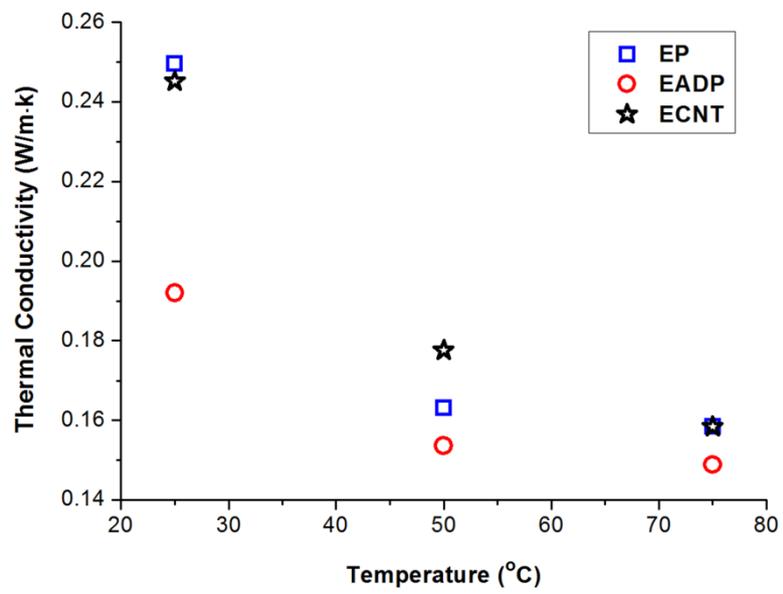
Figure S6. Thermal conductivities of neat epoxy, p-Ap/epoxy and MWCNT/epoxy composites.

Table S1 Shape-memory behaviors of neat epoxy, p-Ap/epoxy and MWCNT/epoxy composites.

Samples	Shape fixity (R_f)	Shape recovery (R_r)
Epoxy	94.6%	97.5%
p-Ap/epoxy	98.2%	90.0%
MWCNT/epoxy	98.4%	93.2%