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Supporting Information

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Unusual Reversible Photomechanical Actuation in Polymer/Nanotube Composites**

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Supporting Information

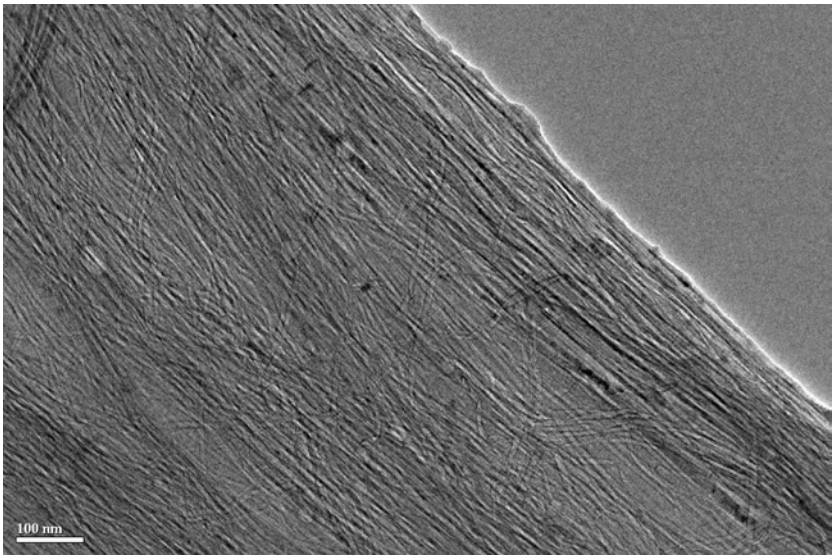

Figure S1. Transmission electron microscopy (TEM) images of ALCP/nanotube composite strips. ALCP was oriented in space of aligned nanotubes.

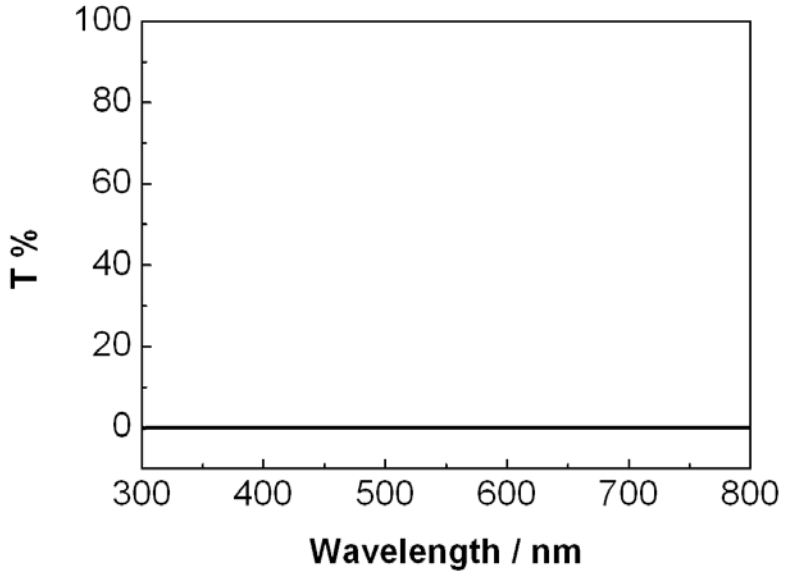

Figure S2. The transmittance of composite strip at a thickness of 1 μm measured by UV-vis spectrometer.

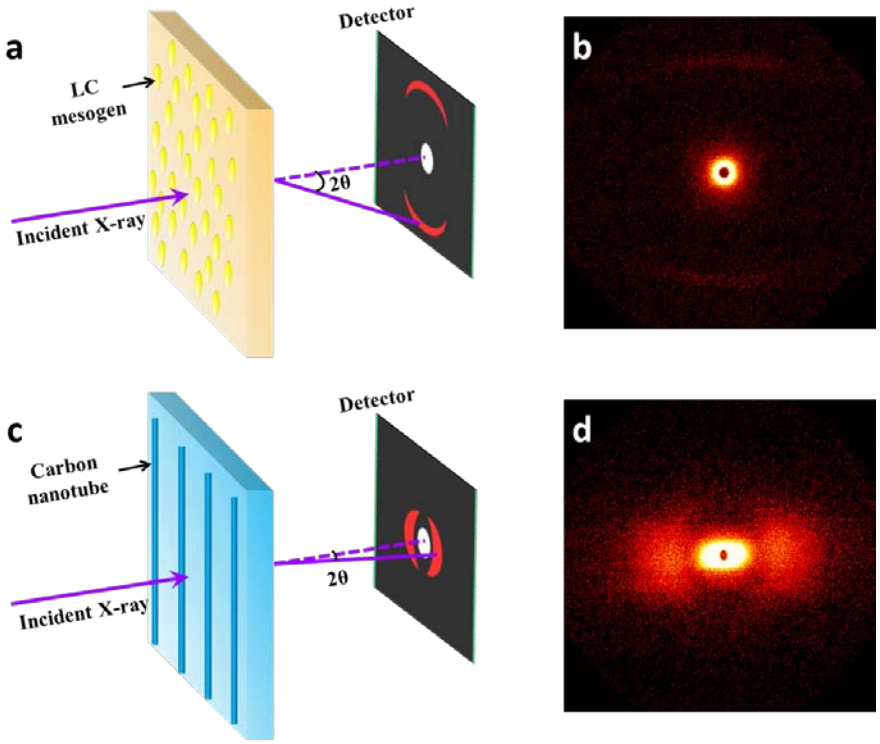

Figure S3. Schematic illustrations and two dimensional small angle X-ray scattering patterns. **a** and **b**. Pure aligned ALCP film. **c** and **d**. Aligned nanotubes.

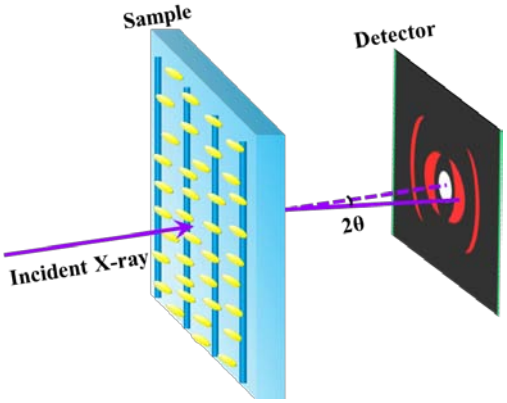

Figure S4. Schematic illustration of experimental setup for small angle X-ray scattering measurement.

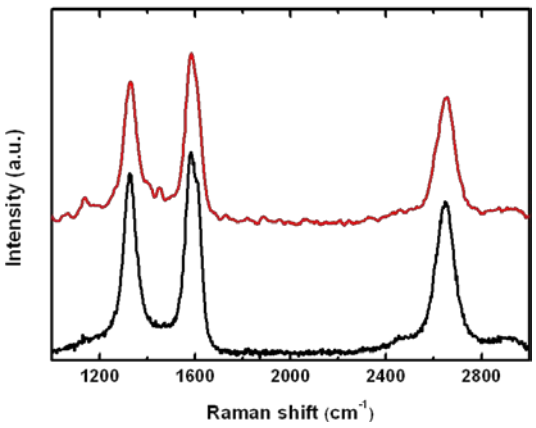

Figure S5. Raman spectra of pure aligned nanotubes (black line) and ALCP/nanotube composite strip (red line).

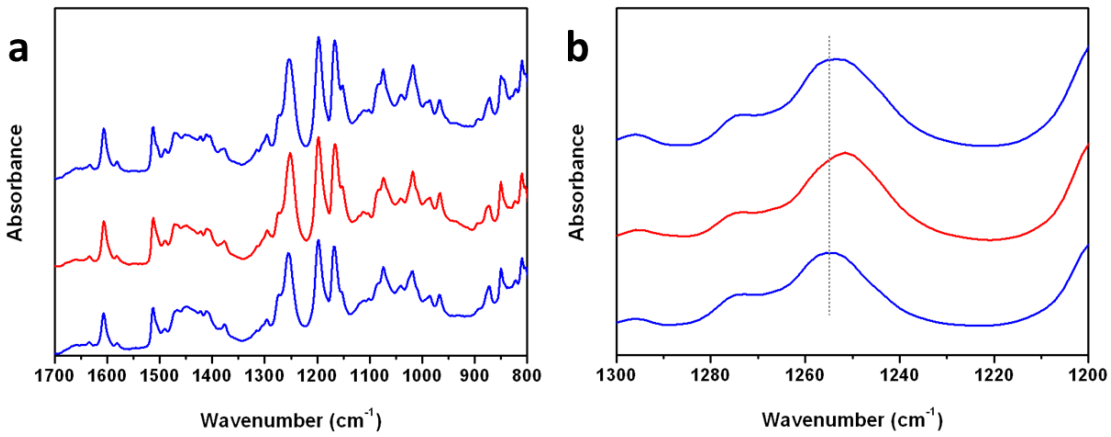

Figure S6. Fourier transform infrared spectroscopy characterization of the ALCP/nanotube composite strip at the same plane. The blue and red lines correspond to the composite strip after UV irradiation at the studied and opposite faces, respectively.

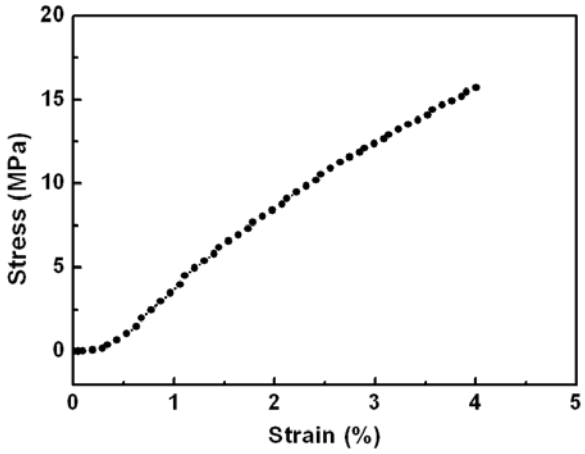

Figure S7. Stress-strain curve of a pure ALCP film.

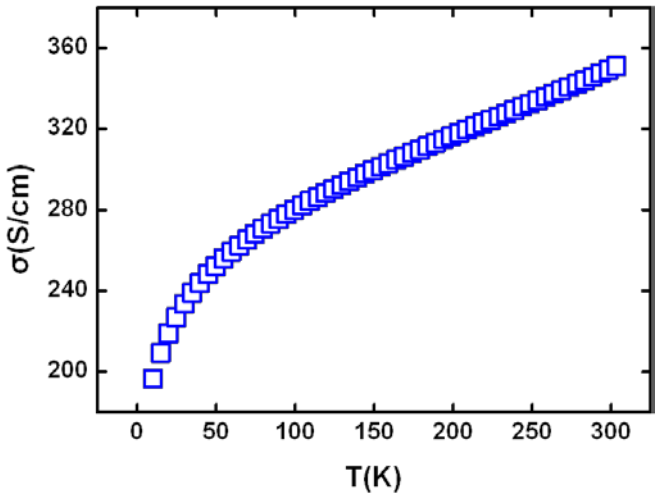

Figure S8. Temperature dependence of the electrical conductivity in the ALCP/nanotube composite film measured by a four-probe method.

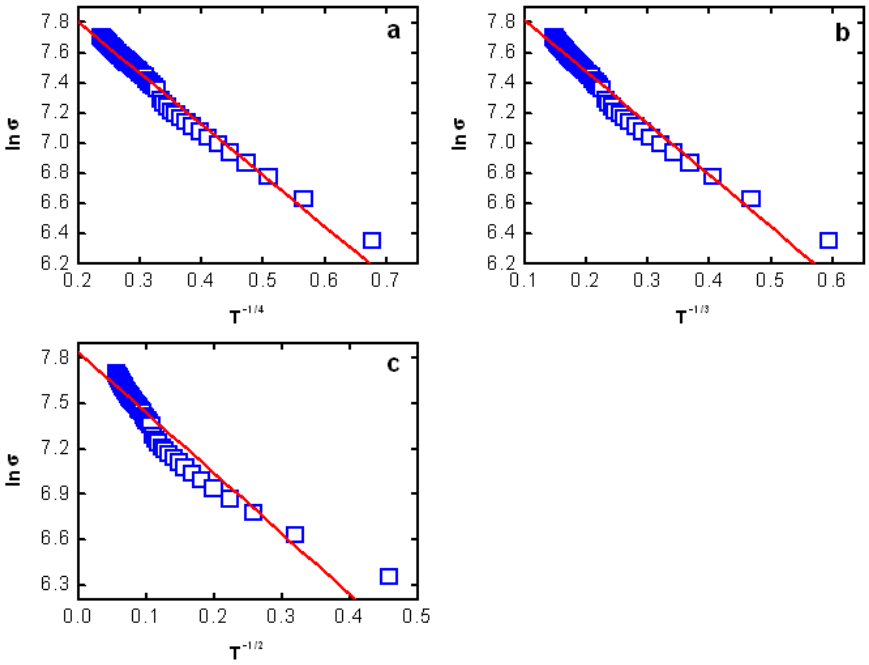

Figure S9. The plots of lnσ *vs.* $T^{-1/(d+1)}$ based on the Mott's variable range hopping model, where σ is the electrical conductivity, T is the temperature, and d is the dimensionality. **a.** Three-dimensional hopping mechanism, i.e., d = 3. **b.** Two-dimensional hopping mechanism, i.e., d = 2. **c.** One-dimensional hopping mechanism, i.e., d = 1.[S1]

Supporting Reference

[S1] H. Peng, *J. Am. Chem. Soc.* **2008**, *130*, 42.