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

Supporting Information

Reduced Graphene Oxide Functionalized Stretchable and Multicolor Electrothermal Chromatic Fibers

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Supporting Figures

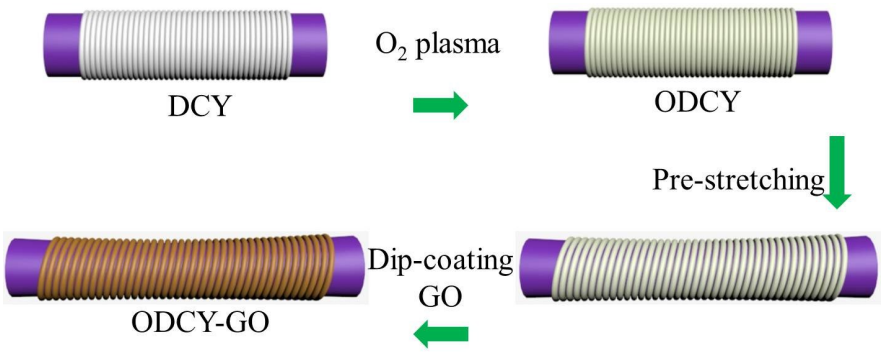

Fig. S1 Partial schematic illustrations of the preparation process.

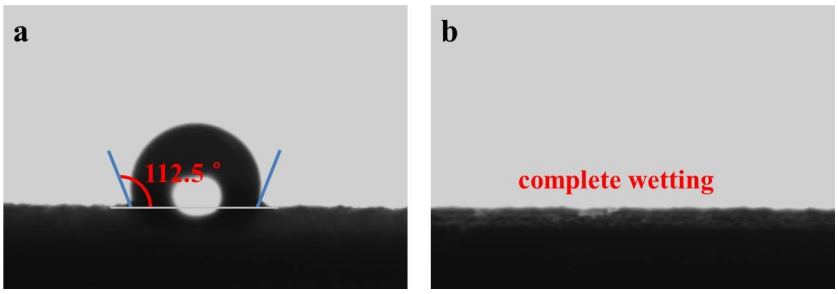

Fig.S2 The contact angle analysis of DCY (a) and ODCY. (b).

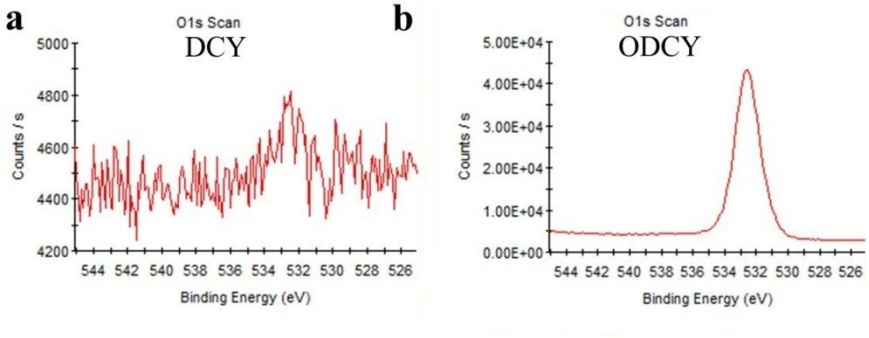

Fig.S3 The XPS of DCY (a) and ODCY (b) with O1s scan.

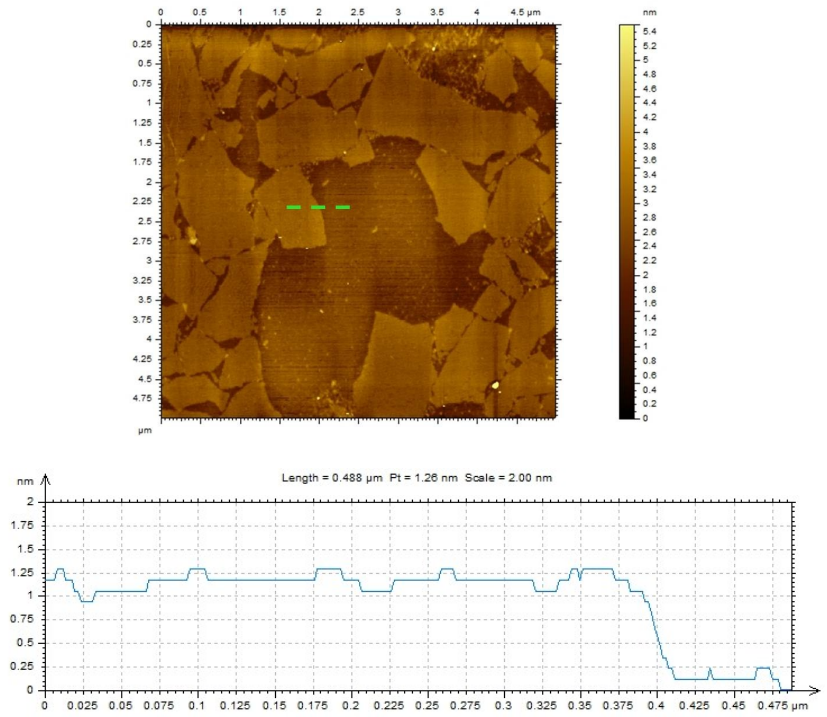

Fig. S4 AFM image and height profile of GO when spin-coated on a silicon wafer.

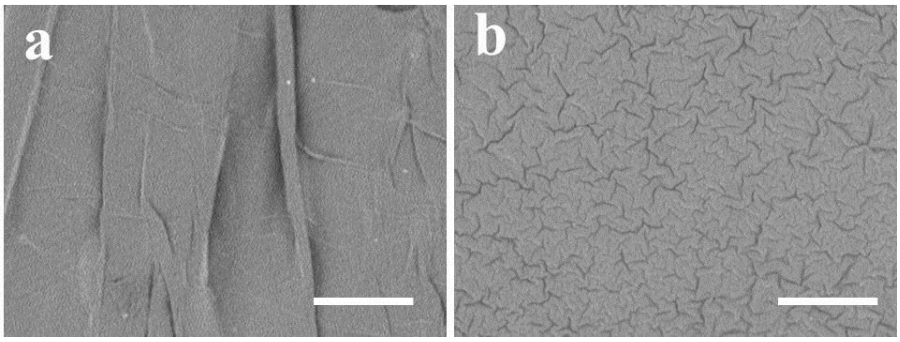

Fig. S5 SEM images of the stretchable electrothermal chromatic fibers. (a) ODCY@GO, (b) ODCY@RGO@TiO_2@PDMS@Ink. Scale bars: 40 μm.

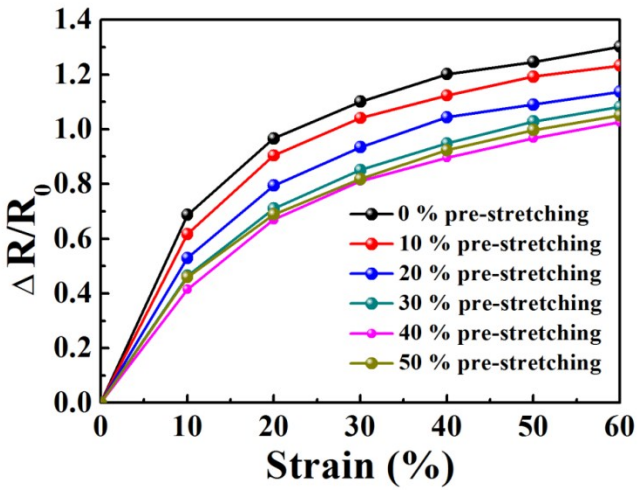

Fig. S6 $\Delta R/R_0$ as a function of tensile strains of stretchable conductive fibers fabricated with ODCY pre-stretching strains.

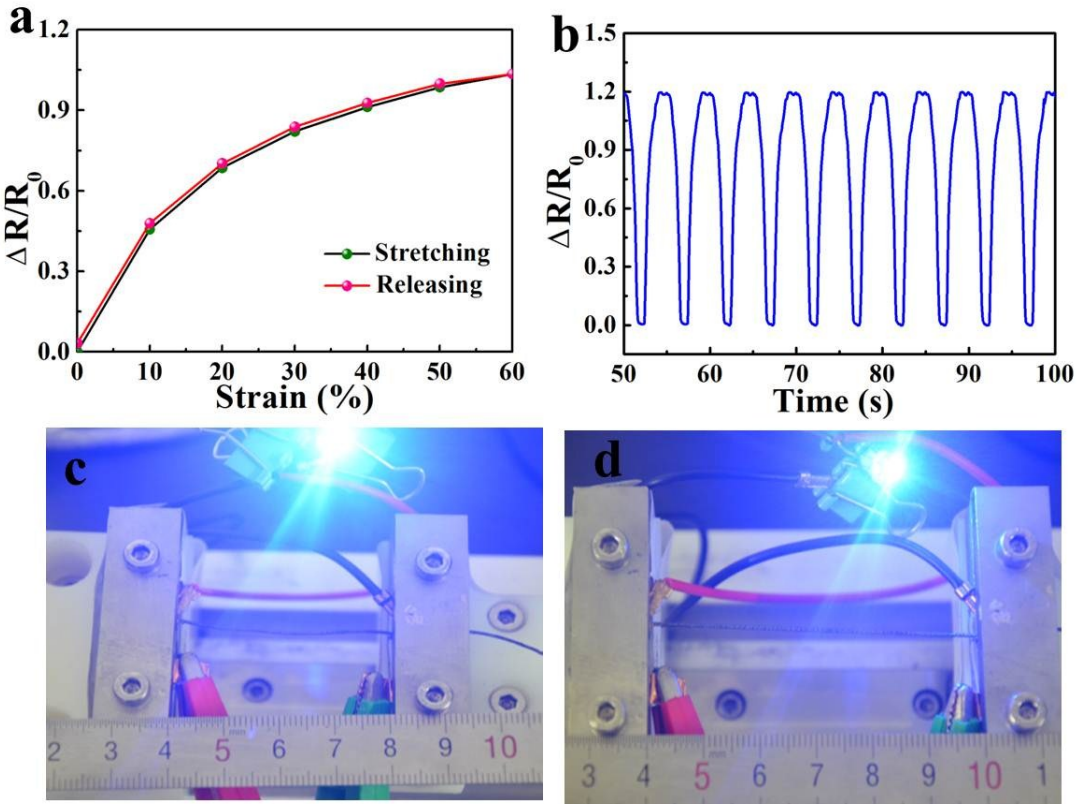

Fig. S7 (a) $\Delta R/R_0$ variation with strain during a stretching/releasing cycle. (b) Stretchable stability of stretchable conductive fibers within 50-100s time range. (c,d) Digital photographs of the LED integrated with the stretchable conductive fibers at 0% and 50% strain under 18V voltage applied.

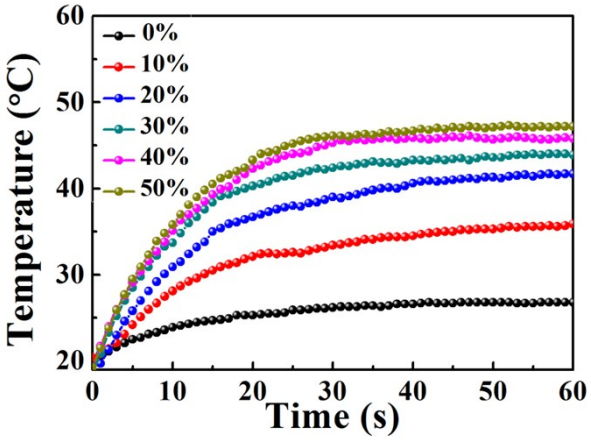

Fig. S8 Temperature-time curves of the electrothermal chromatic fibers under different strains and at a current density of 142 mA/cm.

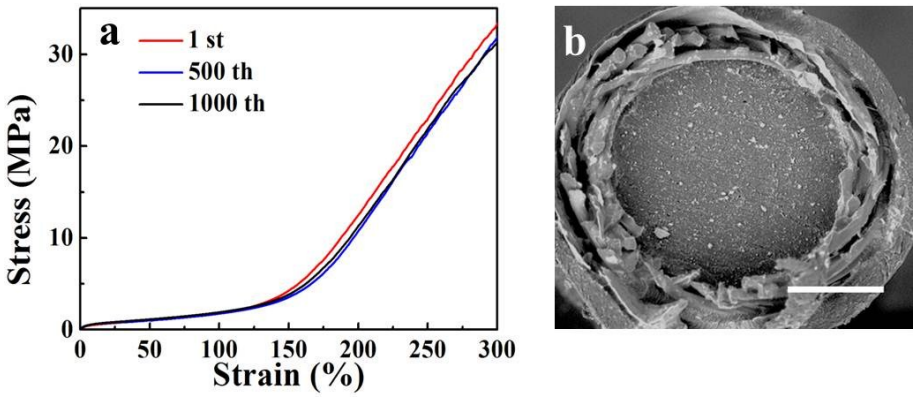

Fig. S9 (a) Stress/strain curves of the fibers under different stretching/releasing cycles.

(b) The cross-sectional SEM of the fiber after1000 stretching/releasing cycles.

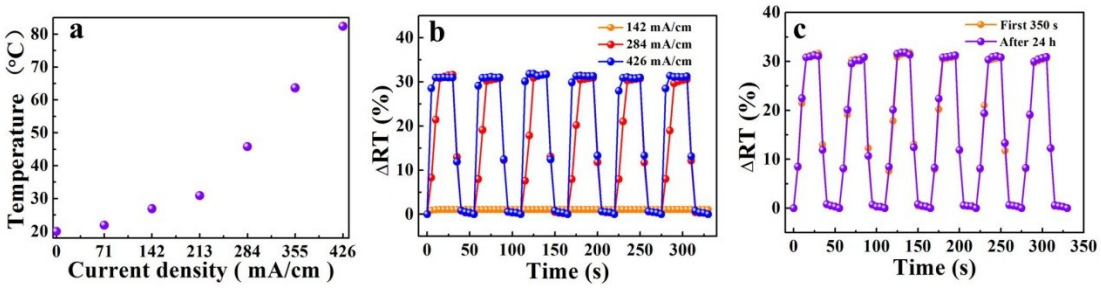

Fig. S10 (a) The maximum temperatures of the stretchable electrothermal chromatic fibers under different current densities. In situ reflectance response (at 505 nm) between the black and green states of the fiber under different current densities (b) and after continuous powering on 24h at 284 mA/cm (c).

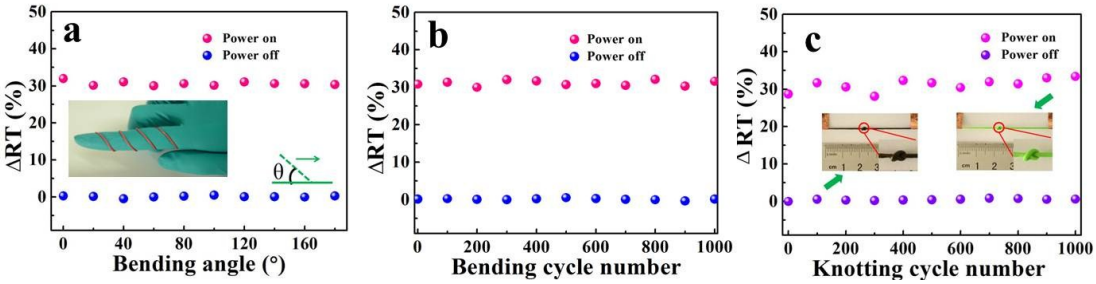

Fig. S11 (a) Dependence of ΔRT at the wavelength of 505 nm on the bending angles of the electrothermal chromatic fibers. (The insert demonstrates a stretchable and electrothermal chromatic fiber winding around a finger). (b) ΔRT as a function of bending cycles between bending angles of 0° and 180°. (c) ΔRT as a function of the knotting cycles. (The inserts demonstrate a knotted electrothermal chromatic fiber before and after applying the current of 284 mA/cm).

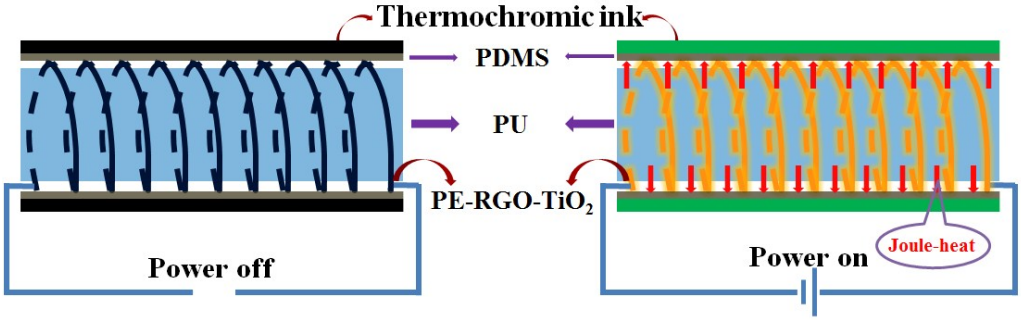

Fig. S12 schematic diagram of color change mechanism for the current switching mode.

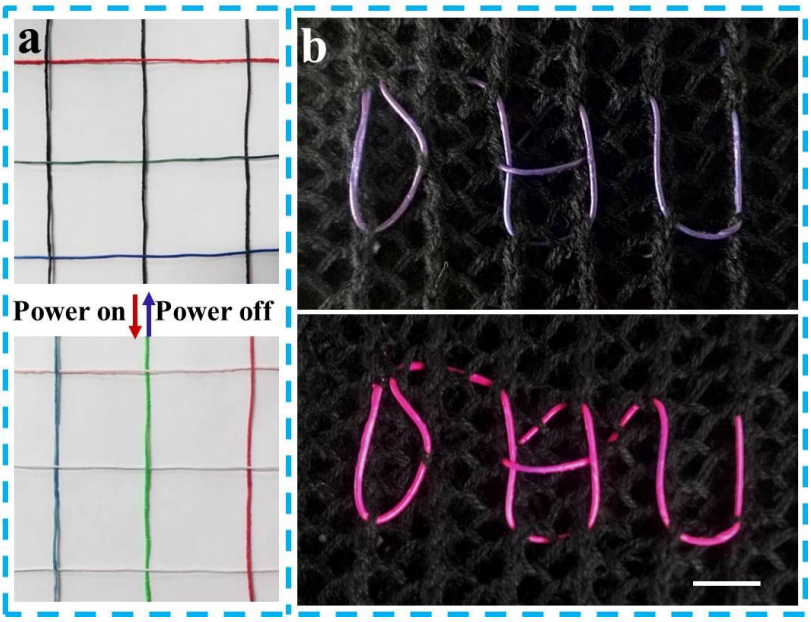

Fig. S13 (a) Photographs of the electrothermal chromatic fibers with different colors. (b) Photographs of a series of the fibers with the pattern of letter “DHU” were implanted into fabrics. Current density: 284 mA/cm.