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

Supporting Information

Stretchable Heaters with Composites of an Intrinsically Conductive Polymer, Reduced Graphene Oxide and an Elastomer for Wearable Thermotherapy

Rui Zhou, Pengcheng Li, Zeng Fan, Donghe Du, and Jianyong Ouyang**

Department of Materials Science & Engineering, National University of Singapore, 7 Engineering Drive 1 117574, Singapore

Corresponding Author

*E-mail: mseoj@nus.edu.sg (Jianyong Ouyang)

*E-mail: pengchengli2013@gmail.com (Pengcheng Li)

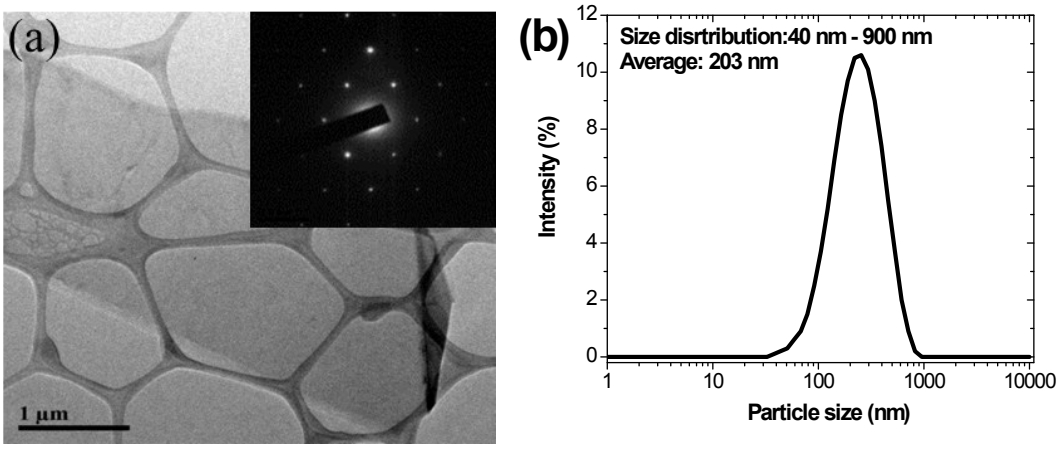

Fig. S1. (a) TEM image and selected area electron diffraction pattern of GO and (b) Dynamic light scattering (DLS) results of graphene oxide dispersion

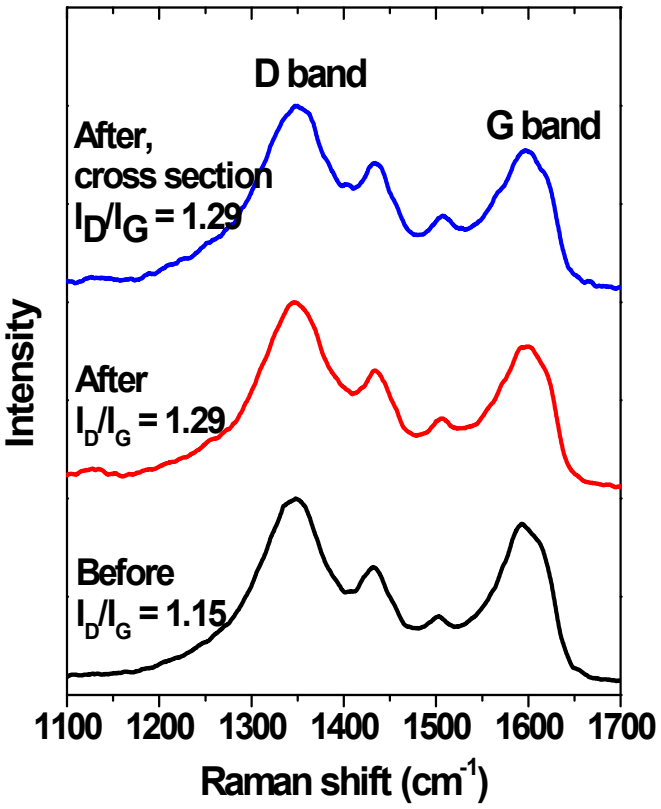

Fig. S2. Raman spectra of a WPU/PEDOT:PSS/1 wt% GO composite film before and after the reduction of GO with a HI solution(both surface and cross section).

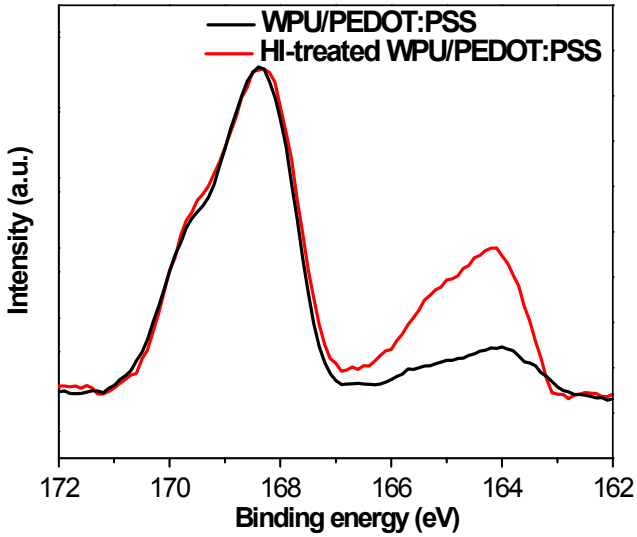

Fig. S3. S2p XPS spectra of WPU/PEDOT:PSS and HI-treated WPU/PEDOT:PSS blend films.

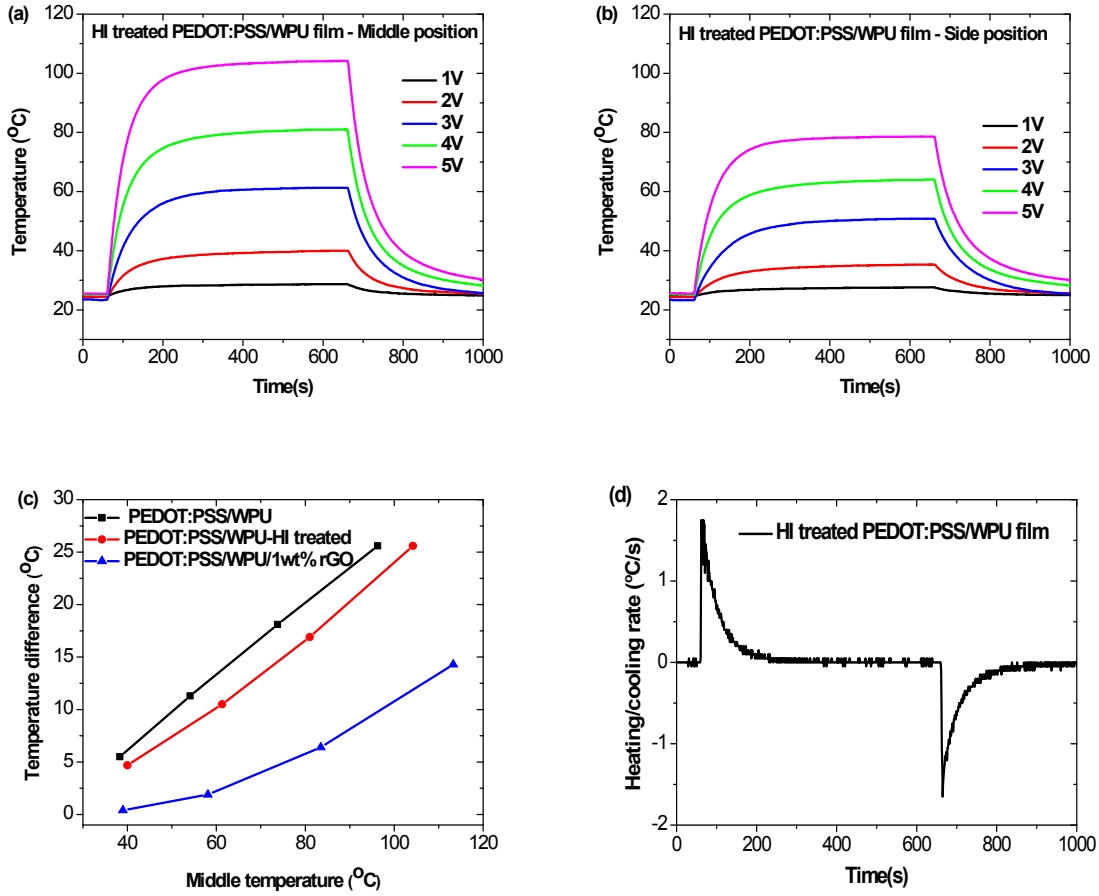

Fig. S4. Time-dependent temperature profiles of a HI treated WPU/PEDOT:PSS blend film in the (a) middle and (b) side position, and (c) middle-to-side temperature difference of

PEDOT:PSS/WPU, HI-treated PEDOT:PSS/WPU and PEDOT:PSS/WPU/1 wt% rGO films as a function of middle position temperature. (d) The variation of the temperature derivative with the time at the applied voltage of 5 V for a HI treated WPU/PEDOT:PSS film.

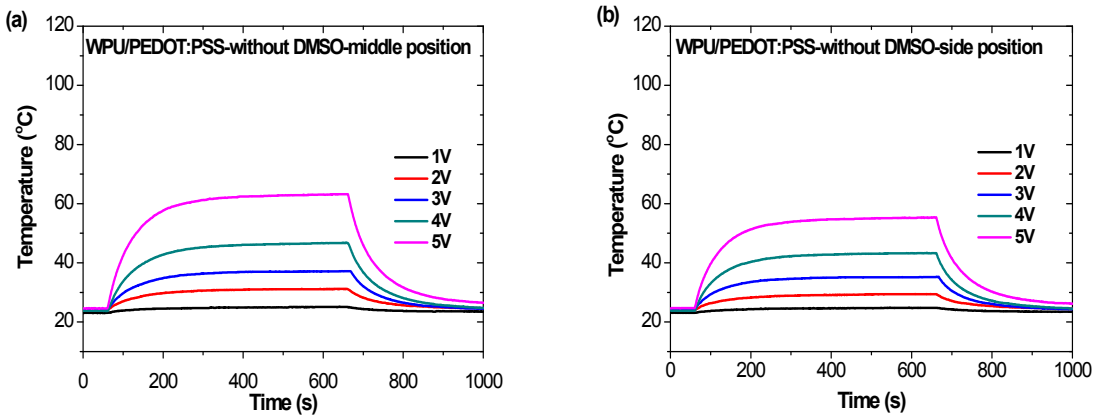

Fig. S5. Time-dependent temperature profiles of a 5wt% PEDOT:PSS/WPU film without addition of DMSO in the (a) middle and (b) side position, which indicate that the heating rate of 5wt% PEDOT:PSS/WPU film without addition of DMSO (conductivity: 4.2 S cm^{-1}) under same voltage is lower than that of 5wt% PEDOT:PSS/WPU film with addition of DMSO (conductivity:12.5 S cm^{-1}).

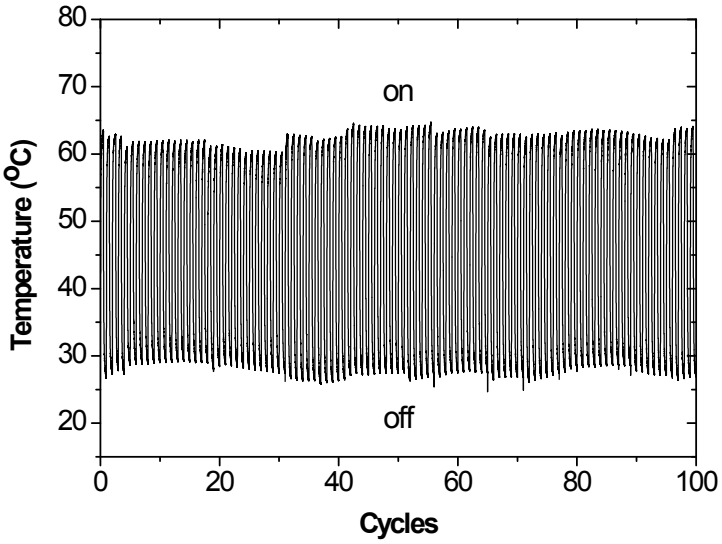

Fig. S6. Temperature on/off responses of a WPU/PEDOT:PSS/1wt% rGO composite film under a voltage of 3 V for 100 cycles.

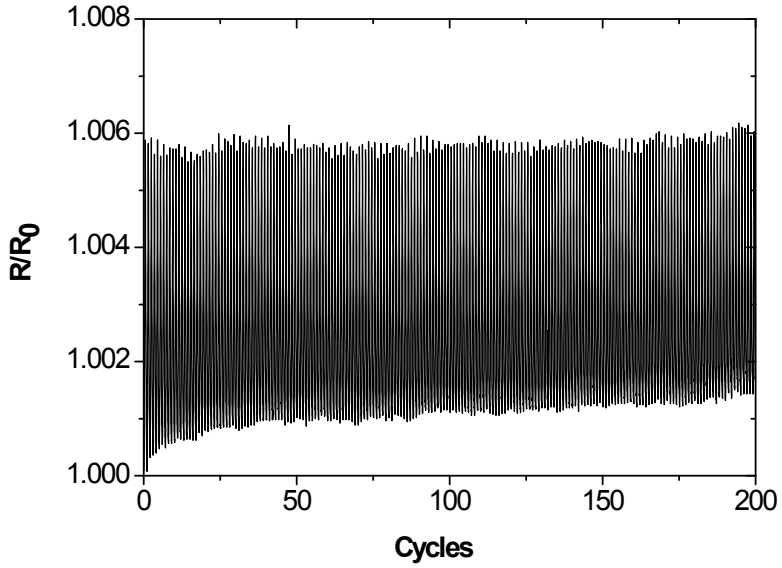

Fig. S7. The relative resistance (R/R_0) in the stretch and release cycles with a strain of 20% for the WPU/PEDOT:PSS/1wt% rGO films with prestretching.