Electronic Supplementary Information

Double-Sided Printed Circuit Textiles Based on Stencil-type Layer-by-Layer Coating with PEDOT:PSS:Ag Nanowires and Chitosan for Electrothermochromic Displays

Seung Hyun Kim, Heung Cho Ko*

School of Materials Science and Engineering, Gwangju Institute of Science and Technology (GIST), 123 Cheomdan-gwagiro Buk-Gu, Gwangju 61005, Republic of Korea

E-mail: heungcho@gist.ac.kr

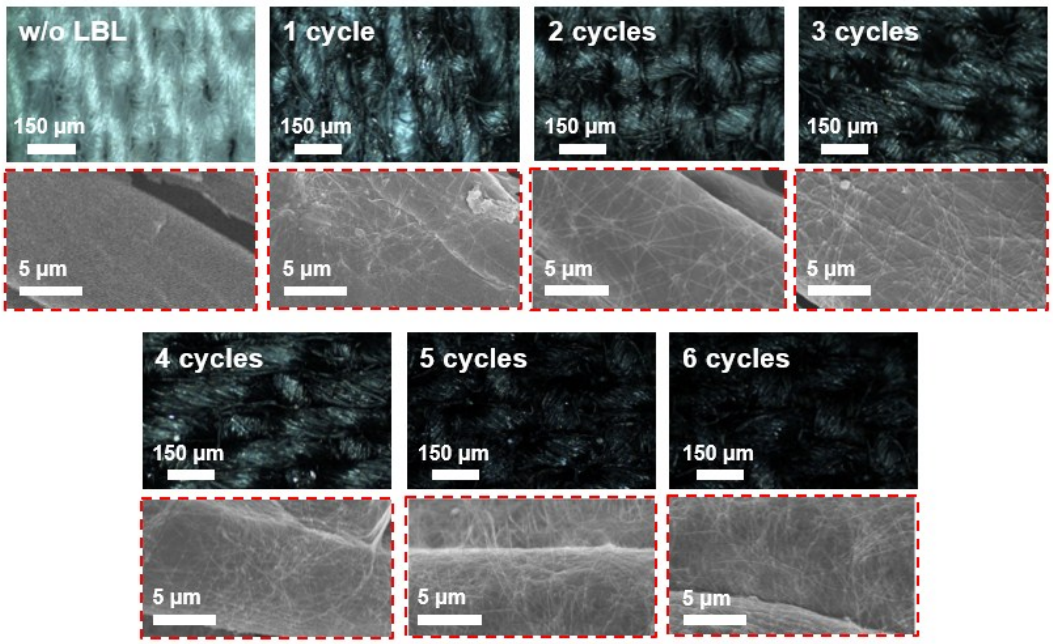

Fig. S1. Optical (top) and SEM (bottom) images of the textiles created by various cyclic (0 to 6) LBL coating processes.

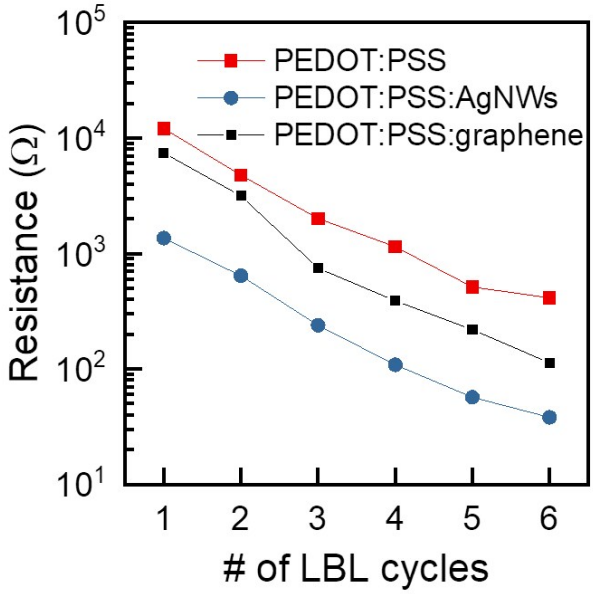

Fig. S2. Resistance profiles for the cotton textiles after various number of LBL coating cycles of PEDOT:PSS only, PEDOT:PSS:AgNWs, and PEDOT:PSS:graphene.

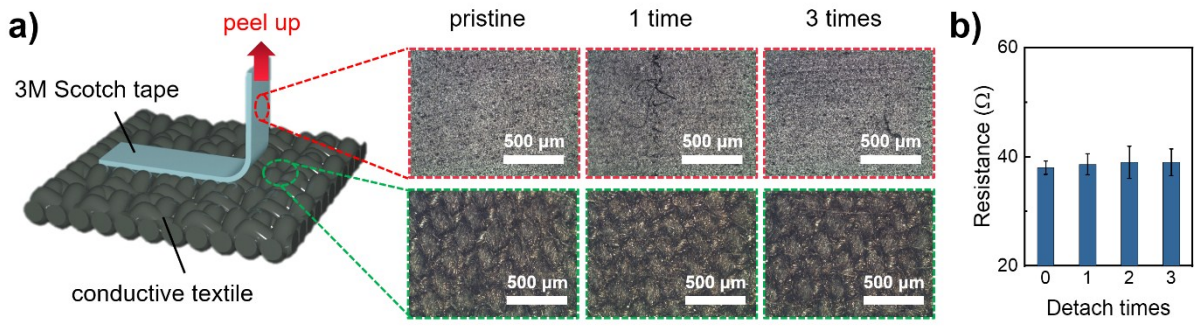

Fig. S3. (a) Detach test of a conductive textile created by 6 cyclic LBL coating processes. Optical images of the adhesive side of 3M tape and the conductive textile in the tested region before and after one and three times of detach test. (b) Resistance profiles of a conductive textile after various repeating times of detach test.

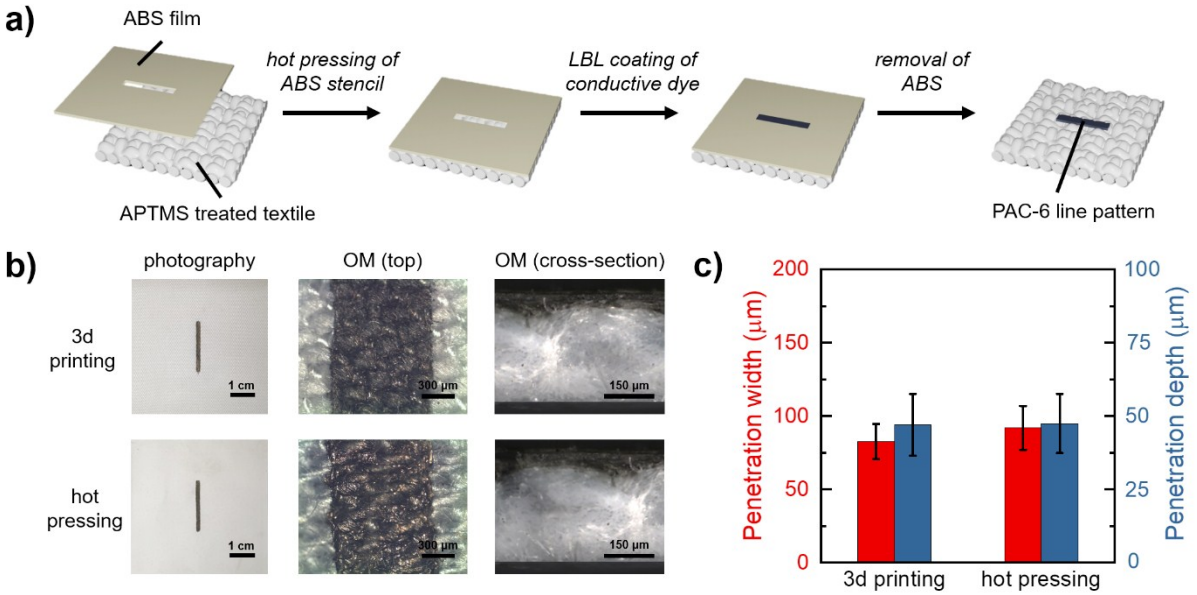

Fig. S4. (a) Schematic illustration for fabricating a PAC-6 line pattern formed using a hot-pressed ABS stencil mask. (b) Photographic and optical images and (c) penetration width and depth profiles of PAC-6 line patterns formed using a hot pressed ABS stencil mask compared to a 3d printed ABS stencil film.

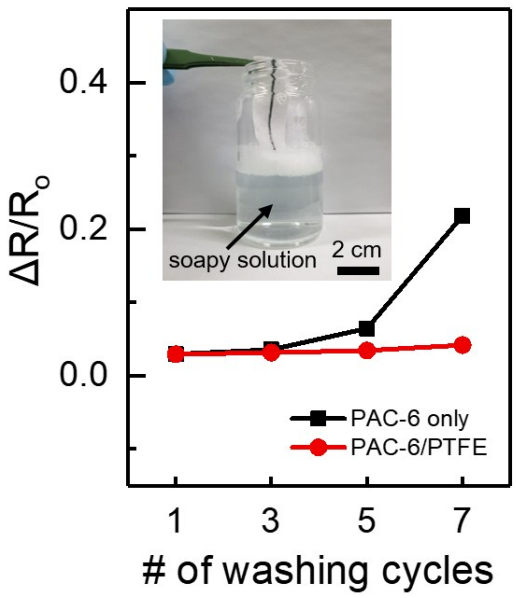

Fig. S5. Normalized resistance change of the samples in Fig. 3a as a function of washing cycles (one cycle: dipping for 20 min and rinsing for 30 min) in a 0.05 wt% diluted commercial soapy solution.

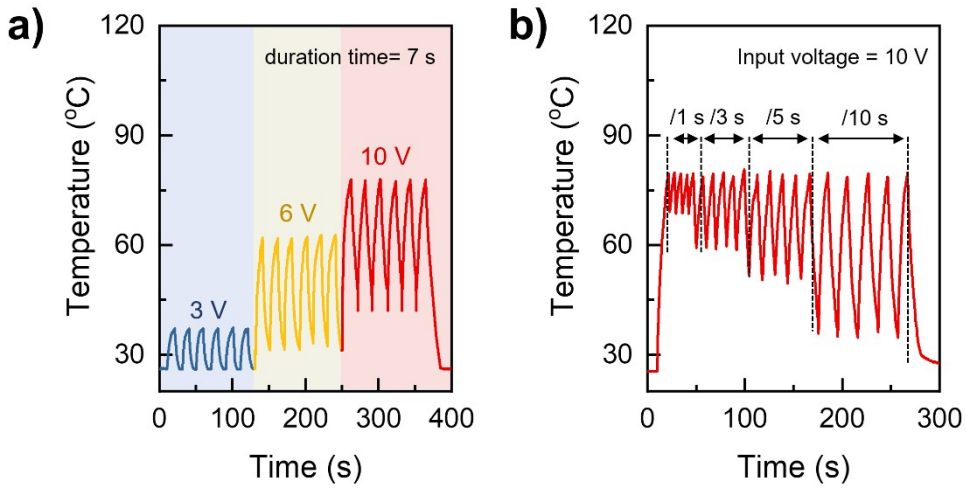

Fig. S6. Time-dependent temperature profiles of the Joule heater in Fig. 4a upon various input voltages and duration times [(a) input voltages = 3 V, 6 V and 10 V, duration time = 7 s and, (b) input voltage =10 V, duration times = 1 s, 3 s, 5 s and 10 s].

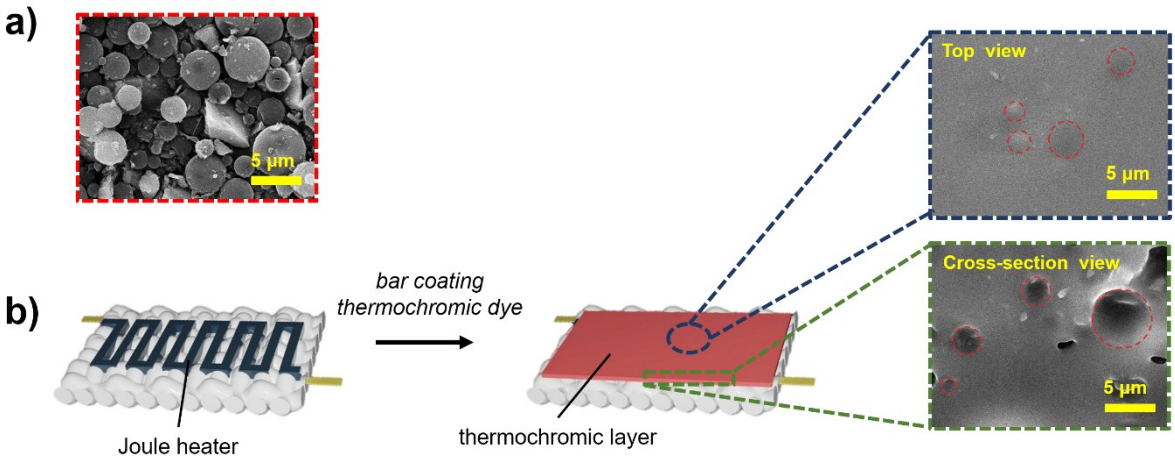

Fig. S7. (a) SEM image of thermochromic microcapsules placed on a carbon tape. (b) Schematic illustration for fabricating an electrothermochromic device; top and cross-sectional SEM images of a thermochromic layer (i.e., a PDMS layer with thermochromic microcapsules) are included.

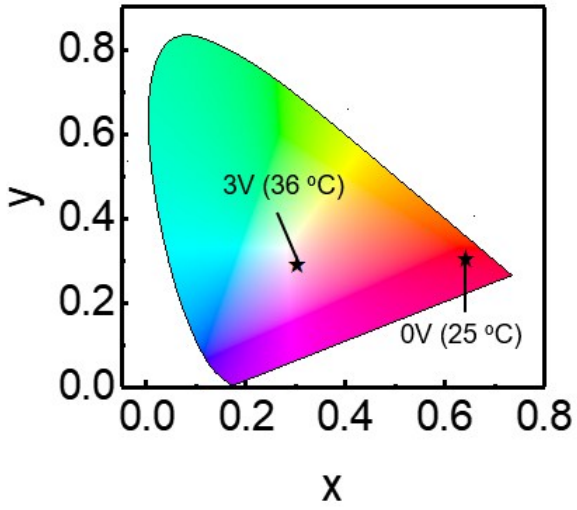

Fig. S8. CIE 1931 XYZ colour space diagram of the electrothermochromic device in Fig. 4e upon applied input voltages of 0 and 3 V.