

Supplementary Information

Considerably Improved Water and Oil Washability of Highly Conductive Stretchable Fibers by Chemical Functionalization with Fluorinated Silane

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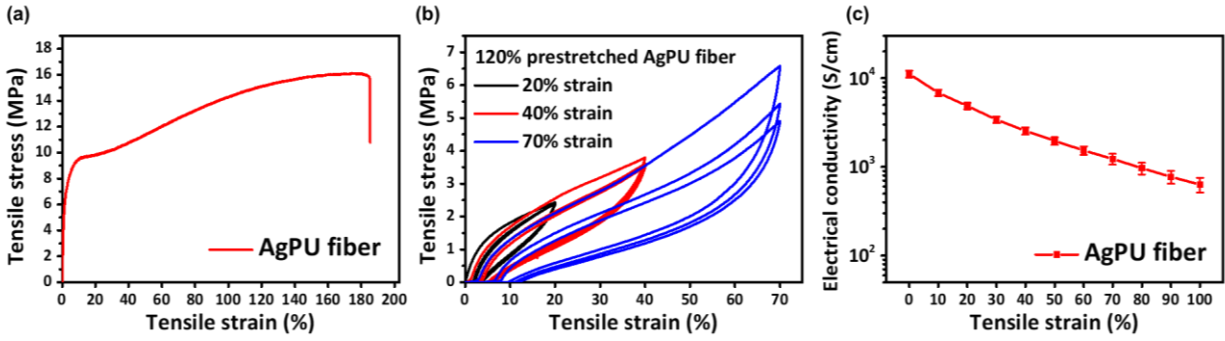


Fig. S1 The mechanical and electrical properties of the AgPU fiber as a function of tensile strain.

(a) Stress-strain analysis (strain rate = 0.83 %/s). (b) Three cyclic stress-strain curves with maximum strains of 20, 40, and 70 %. (c) The electrical conductivity-strain analysis of the AgPU fiber.

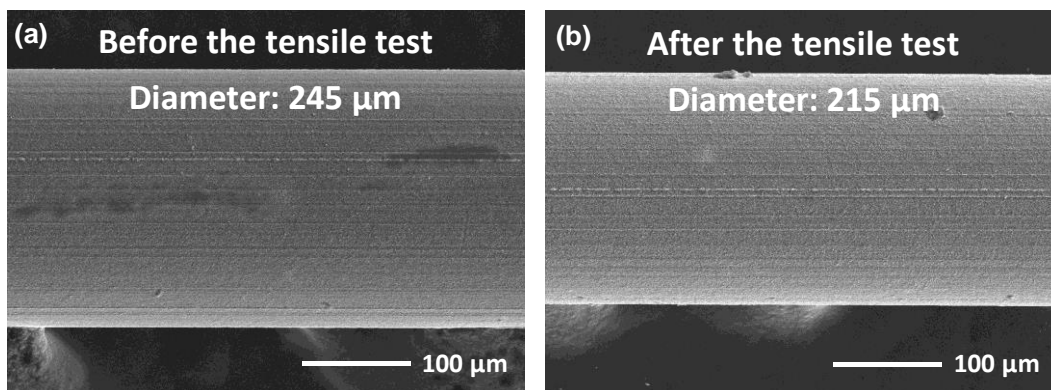


Fig. S2 SEM images of the AgPU fiber before and after the tensile test (maximum strain = 180%). Both SEM images were taken at 0% strain.

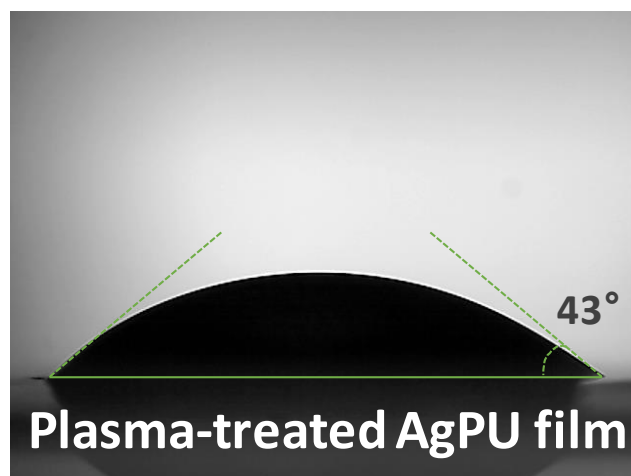


Fig. S3 A deionized water droplet (5 μL) on the plasma-treated AgPU film.

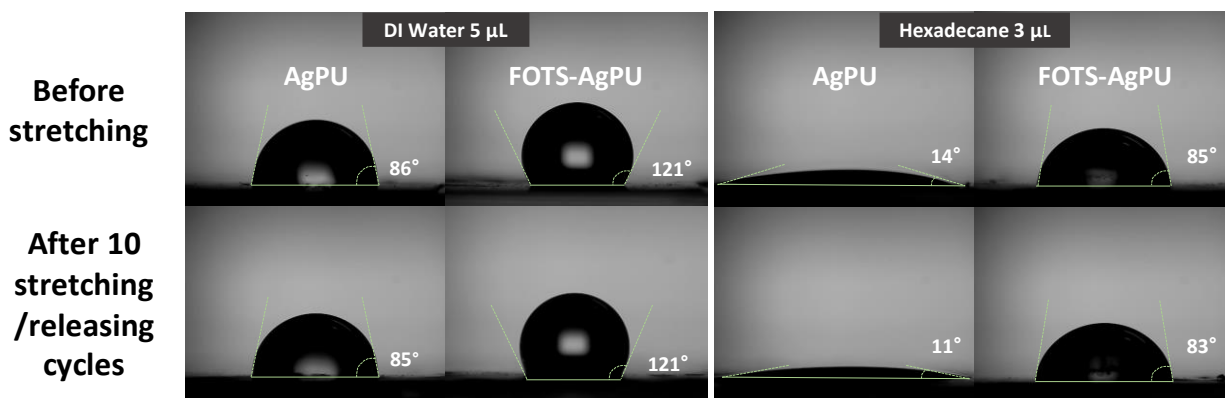


Fig. S4 Water and oil contact angles on the AgPU and FOTS-AgPU films before and after 10 stretching/releasing cycles (maximum strain = 50%).

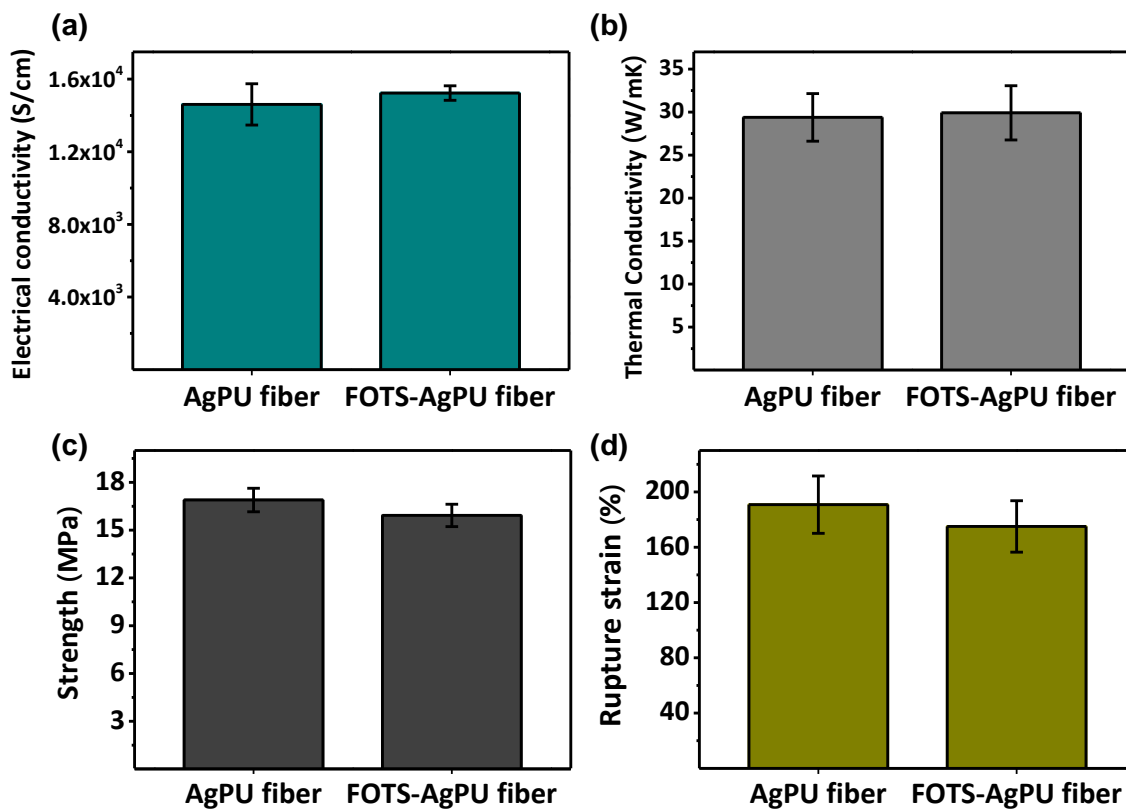


Fig. S5 (a) The electrical conductivity, (b) thermal conductivity, (c) mechanical strength, and (d) rupture strain of the AgPU fiber before and after the FOTS functionalization.

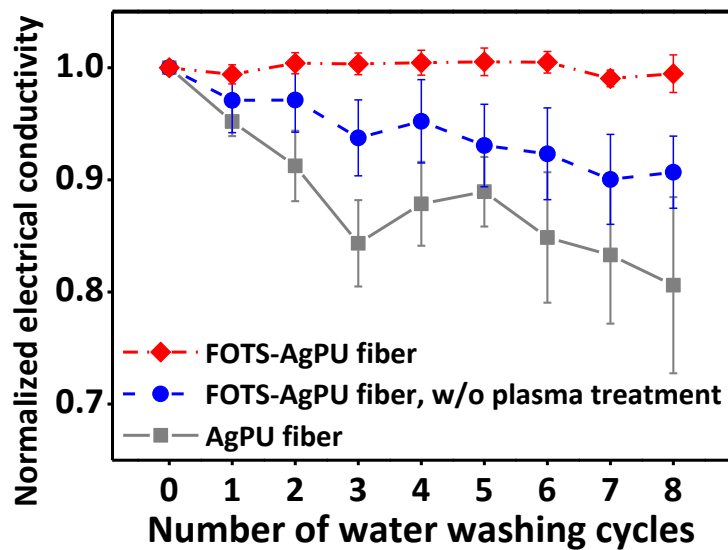


Fig. S6 Normalized electrical conductivity of the FOTS-AgPU (5h), FOTS-AgPU (5h) without plasma treatment, and pristine AgPU fibers as a function of the number of washing cycles. The data of the FOTS-AgPU (5h) and pristine AgPU fibers were reproduced from Figure 3b for comparison.

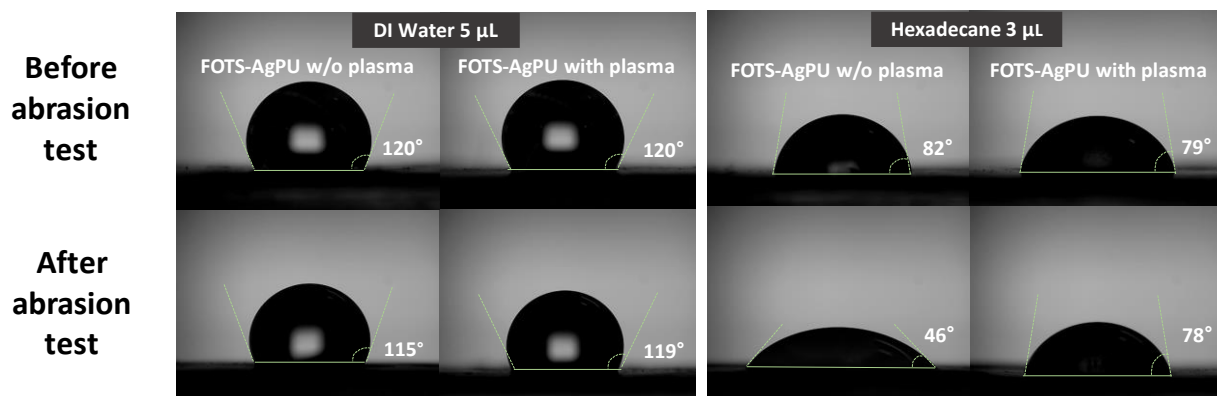


Fig. S7 Water and hexadecane contact angles on the FOTS-AgPU films, with and without the plasma treatment, before and after the abrasion test (normal load = 3.7 N, 480 cycles).

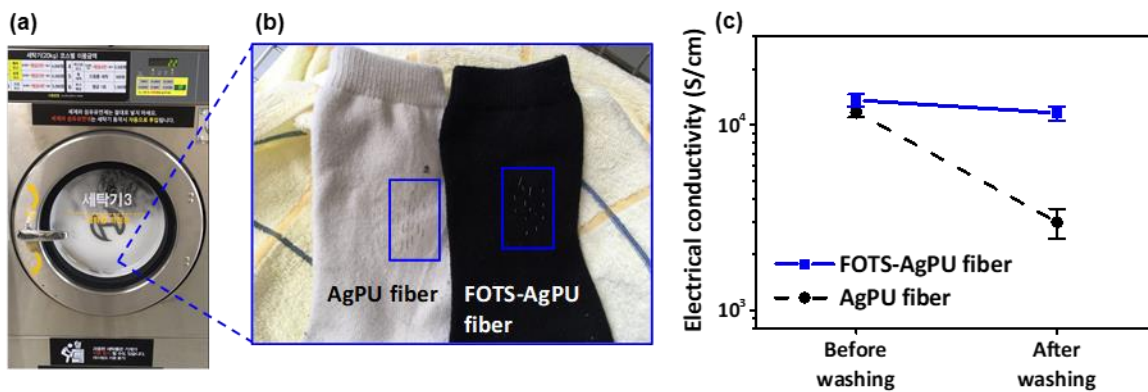


Fig. S8 The AgPU and FOTS-AgPU fibers were washed using a commercial water washing machine. (a) A commercial water washing machine (Alliance Laundry Systems, HCK040, capacity = 180 L). (b) The AgPU and FOTS-AgPU fibers were knitted with socks. (c) Electrical conductivity of the AgPU and FOTS-AgPU fibers before and after the detergent water washing test.

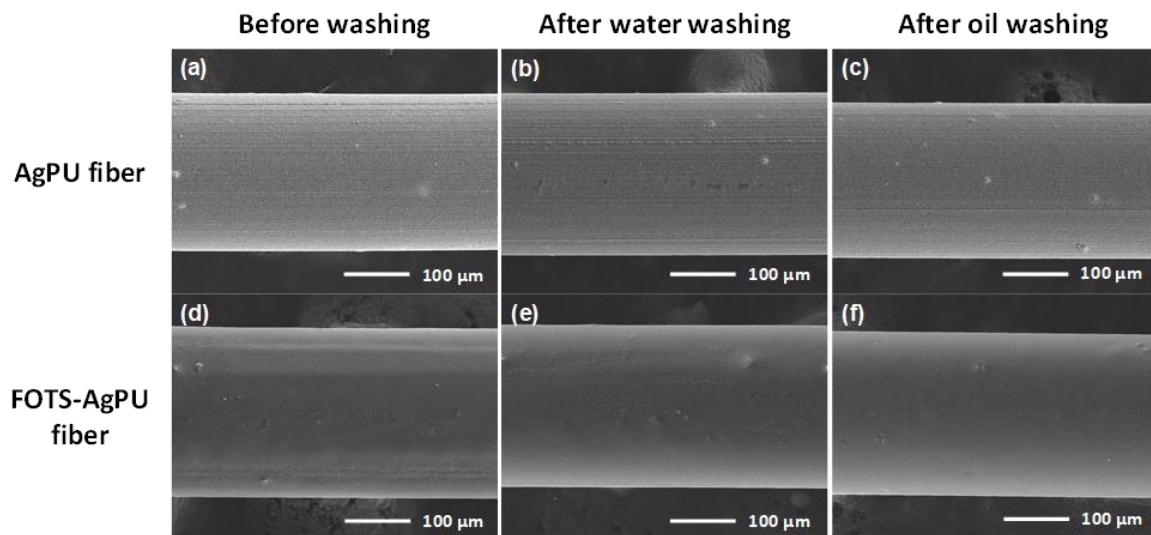


Fig. S9 SEM images of the AgPU (a-c) and FOTS-AgPU (d-f) fibers before and after the water and oil washing processes.

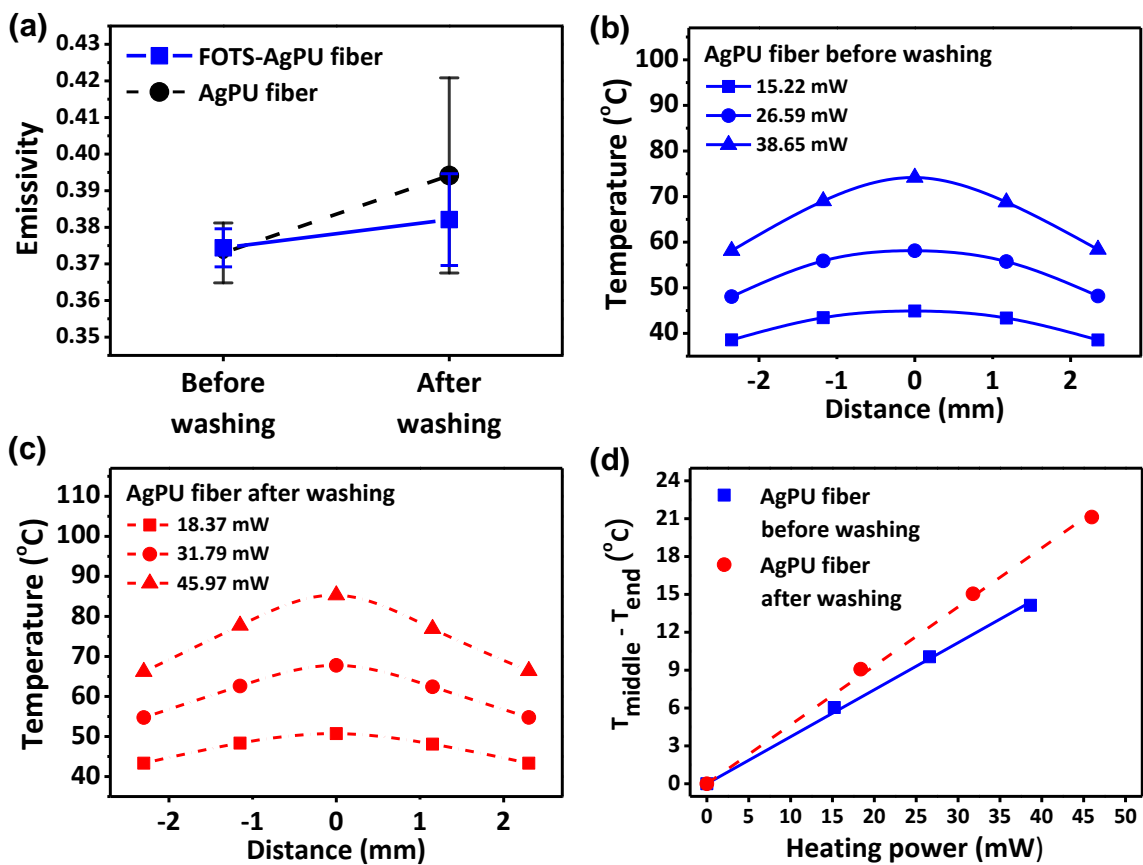


Fig. S10 Thermal analysis of the AgPU fiber before and after the washing cycles. (a) Emissivities of the AgPU and FOTS-AgPU fibers before and after the washing cycles. (b, c) Temperature distributions of the Joule-heated AgPU fiber, before and after the 8 washing cycles, as a function of the applied power. (d) The linearity of the temperature difference between the center and end of the AgPU fiber with respect to the Joule heating power.

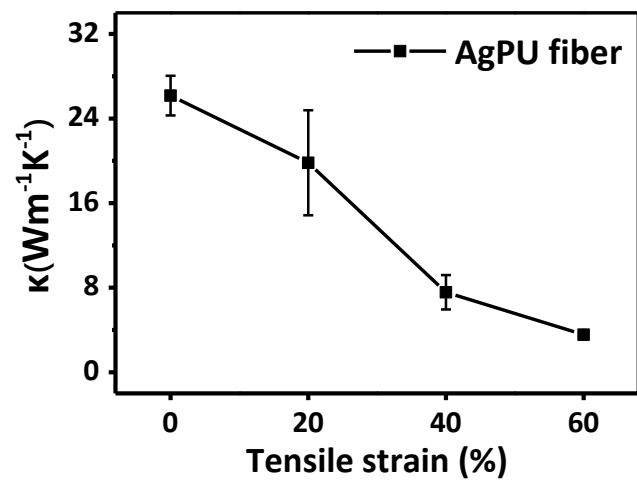


Fig. S11 The thermal conductivity of the AgPU fiber as a function of tensile strain.