

Supporting Information

Compliment Graphene Oxide Coating on Silk Fiber Surface via Electrostatic Force for Capacitive Humidity Sensor Applications

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Table S1. Triboelectric table predicting which will become positive vs. negative and how strong the effect will be.¹

Insulator name	Charge affinity nC/J	Metal effect ²
Polyurethane foam	+60	+N
Sorbothane	+58	-W
Box sealing tape (BOPP)	+55	+W
Hair, oily skin	+45	+N
Solid polyurethane, filled	+40	+N
Magnesium fluoride (MgF ₂)	+35	+N
Nylon, dry skin	+30	+N
Machine oil	+29	+N
Nylatron (nylon filled with MoS ₂)	+28	+N
Glass (soda)	+25	+N
Paper (uncoated copy)	+10	-W
Wood (pine)	+7	-W
GE brand Silicone II (hardens in air)	+6	+N
Cotton	+5	+N
Nitrile rubber	+3	-W
Wool	0	-W
Polycarbonate	-5	-W
ABS	-5	-N
Acrylic (polymethyl methacrylate) and adhesive side of clear carton-sealing and office tape	-10	-N
Epoxy (circuit board)	-32	-N
Styrene-butadiene rubber (SBR, Buna S)	-35	-N
Solvent-based spray paints	-38	-N
PET (mylar) cloth	-40	-W
PET (mylar) solid	-40	+W
EVA rubber for gaskets, filled	-55	-N
Gum rubber	-60	-N
Hot melt glue	-62	-N
Polystyrene	-70	-N
Polyimide	-70	-N
Silicones (air harden & thermoset, but <i>not</i> GE)	-72	-N
Vinyl: flexible (clear tubing)	-75	-N
Carton-sealing tape (BOPP), sanded down	-85	-N
Olefins (alkenes): LDPE, HDPE, PP	-90	-N
Cellulose nitrate	-93	-N
Office tape backing (vinyl copolymer?)	-95	-N
UHMWPE	-95	-N
Neoprene (polychloroprene, <i>not</i> SBR)	-98	-N
PVC (rigid vinyl)	-100	-N
Latex (natural) rubber	-105	-N
Viton, filled	-117	-N

Epichlorohydrin rubber, filled	-118	-N
Santoprene rubber	-120	-N
Hypalon rubber, filled	-130	-N
Butyl rubber, filled	-135	-N
EDPM rubber, filled	-140	-N
Teflon	-190	-N

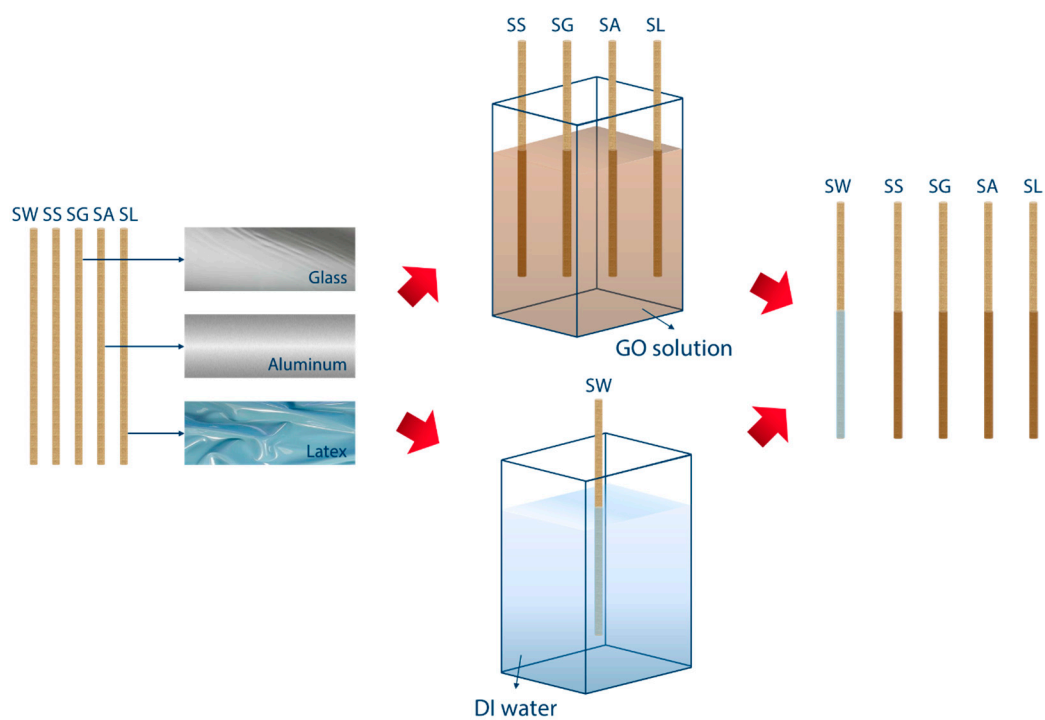


Figure S1. Schematic drawing of various GO coating process on SF. For comparison, DI-soaked SF (SW) was also prepared.

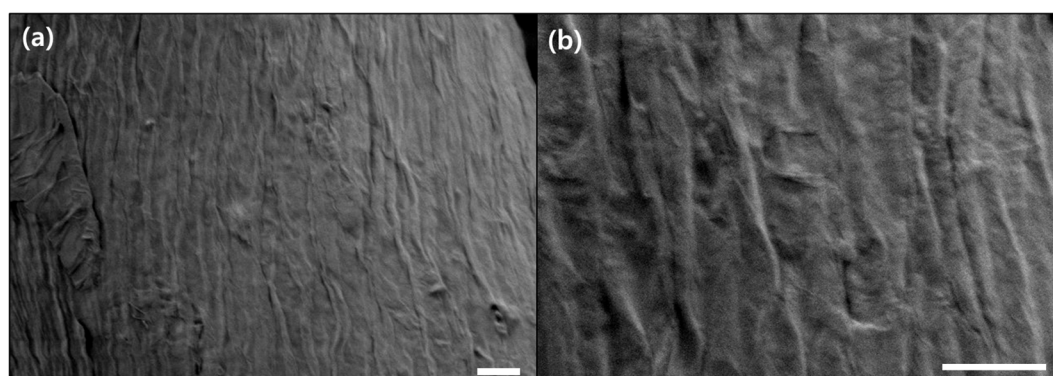


Figure S2. (a) and (b) SEM images of GO-coated SF (SL) (scale bar: 1 μm)

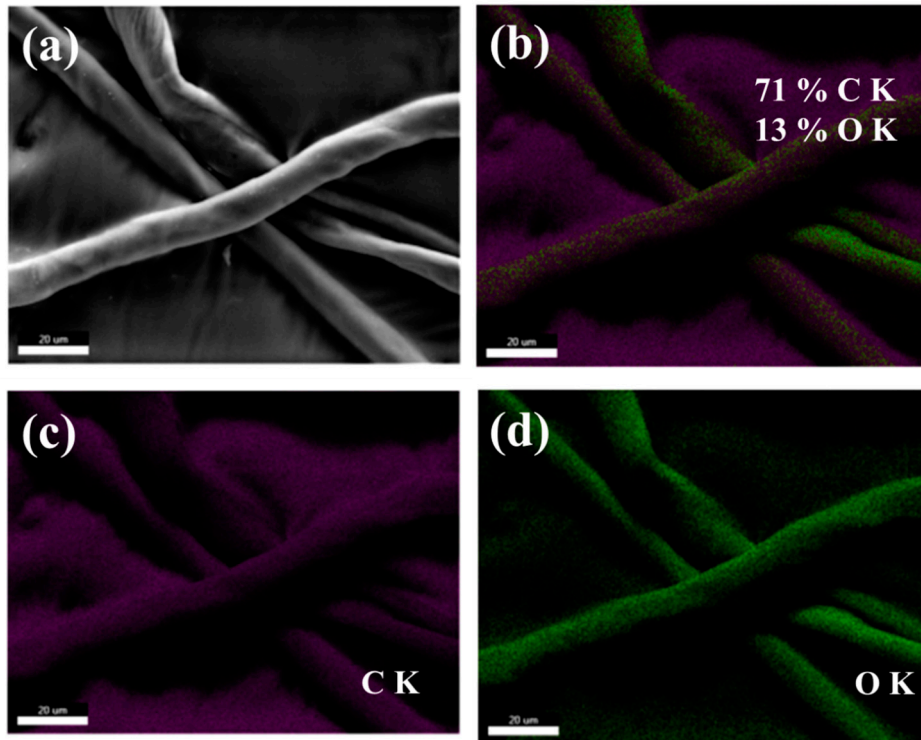


Figure S3. EDS images of GO-coated SF (SL) along with the quantitative data. (a) SEM image of the SL, (b) the elemental maps using both C K and O K, (c) C K, and (d) O K. (scale bar : 20μm)

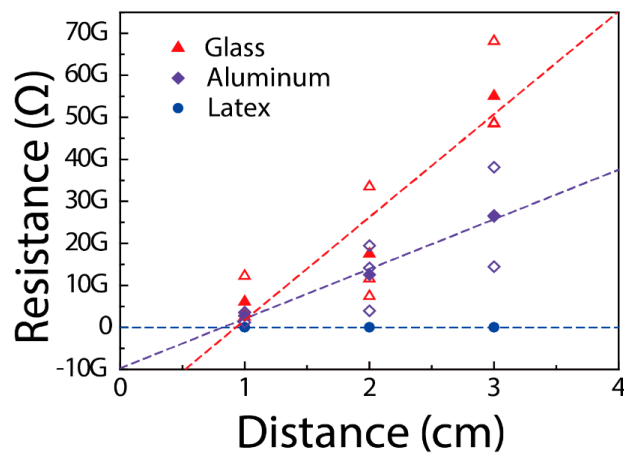


Figure S4. Resistance of GO-coated SF at various conditions as a function of distance; SFs were rubbed with each material (glass, aluminum, and latex) before soaking in GO solution.

Supplementary References

- 1 Tests were performed by Bill Lee (Ph.D., physics) ©2009 by AlphaLab, Inc. (TriField.com), which also manufactured the test equipment used. This table may be reproduced only if reproduced in whole.
- 2 Charge acquired if rubbed with metal (W = weak, N = normal, or consistent with the affinity).