

SUPPLEMENTARY INFORMATION

Bio-inspired hierarchically structured polymer fibers for anisotropic non-wetting surfaces

Muhammad Yunusa,^{ab} Fahri Emre Ozturk,^{ab} Adem Yildirim,^{ab} Urandelger Tuvshindorj,^{ab} Mehmet Kanik,^{ab} and Mehmet Bayindir^{*abc}

^aUNAM-National Nanotechnology Research Center, ^bInstitute of Materials Science and Nanotechnology, and ^cDepartment of Physics, Bilkent University, 06800 Ankara, Turkey

*Corresponding author, E-mail: mb@4unano.com

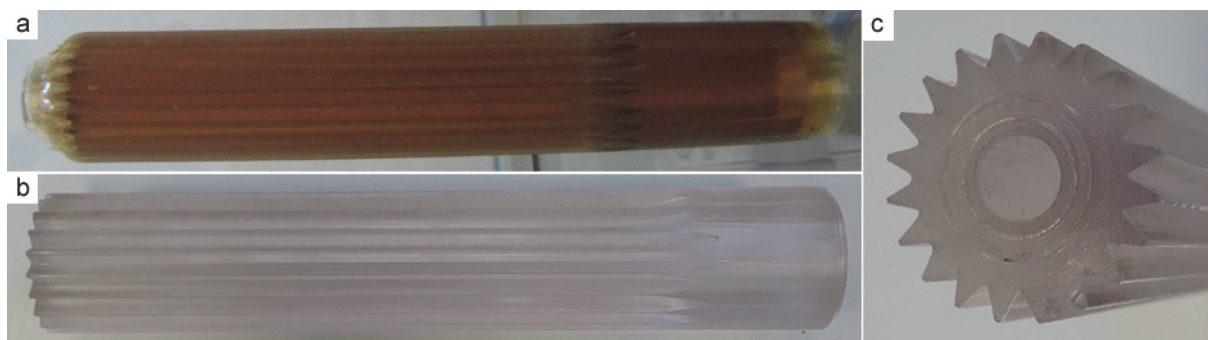


Figure S1. Polymer preforms grooved in lathe prior to fiber drawing. (a) PEI grooved preform, (b) PC grooved preform, and (c) edge view of PC grooved preform showing grooves and hollow core after removing Teflon rod.

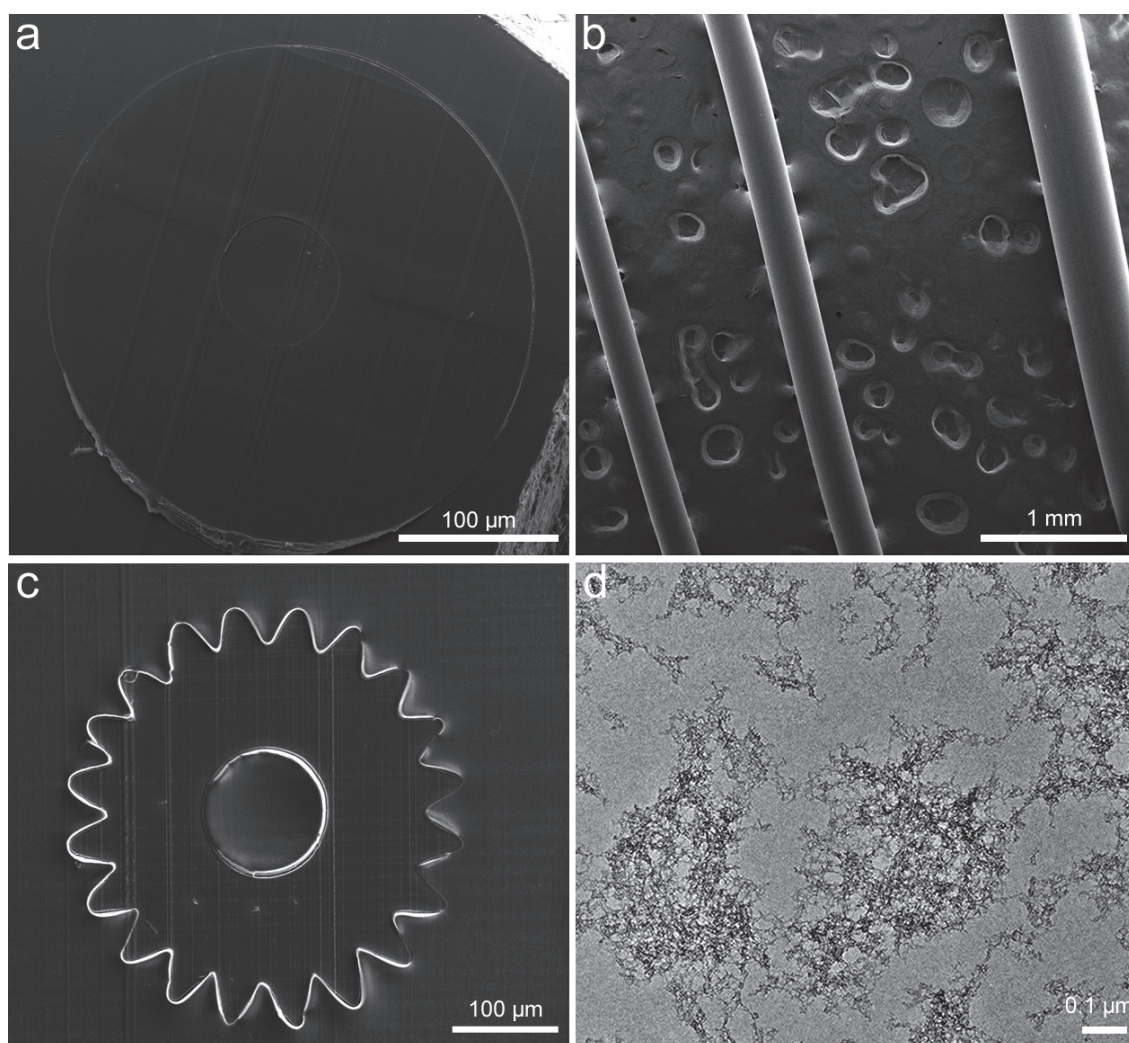


Figure S2. SEM image of (a) cross-section of smooth PEI fiber with a diameter of 300 μm , (b) 200 μm , 300 μm , and 500 μm of smooth PEI fibers, (c) cross-section of PC star-shaped fiber of 300 μm diameter, and (d) TEM micrograph of interconnected ormosil colloidal nanoparticles (with sizes of about 10 nm) forming a porous network layer.

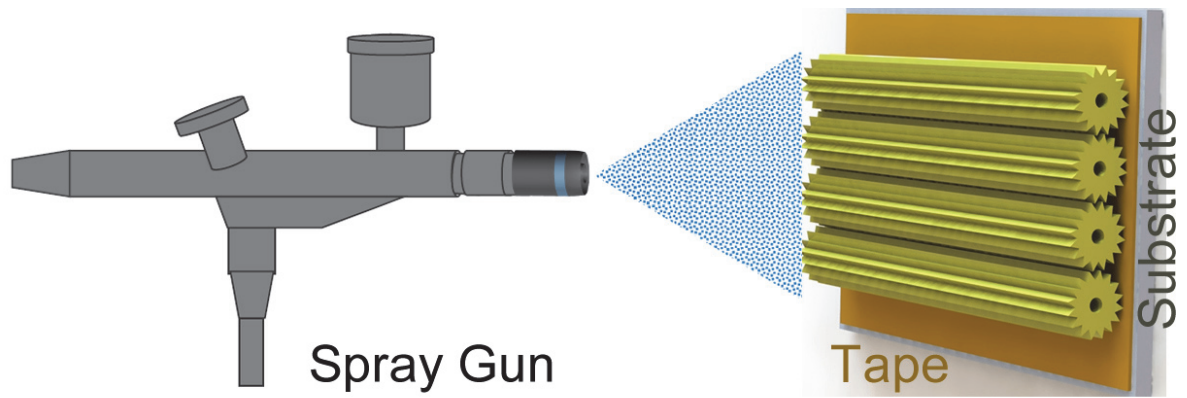


Figure S3. Schematic illustration of ORMOSIL nanoparticle spray coating on fiber surface. Spray gun is loaded with diluted ORMOSIL solution, and then a surface is brought into close proximity (approximately 30 cm away from the gun) with the gun. ORMOSIL gel was diluted in methanol solution. Pressurized nitrogen gas passes through the gun at 2 bar and the solution is sprayed onto fibers for about 2 – 3 seconds at ambient atmosphere. The sample is let dried at room temperature.

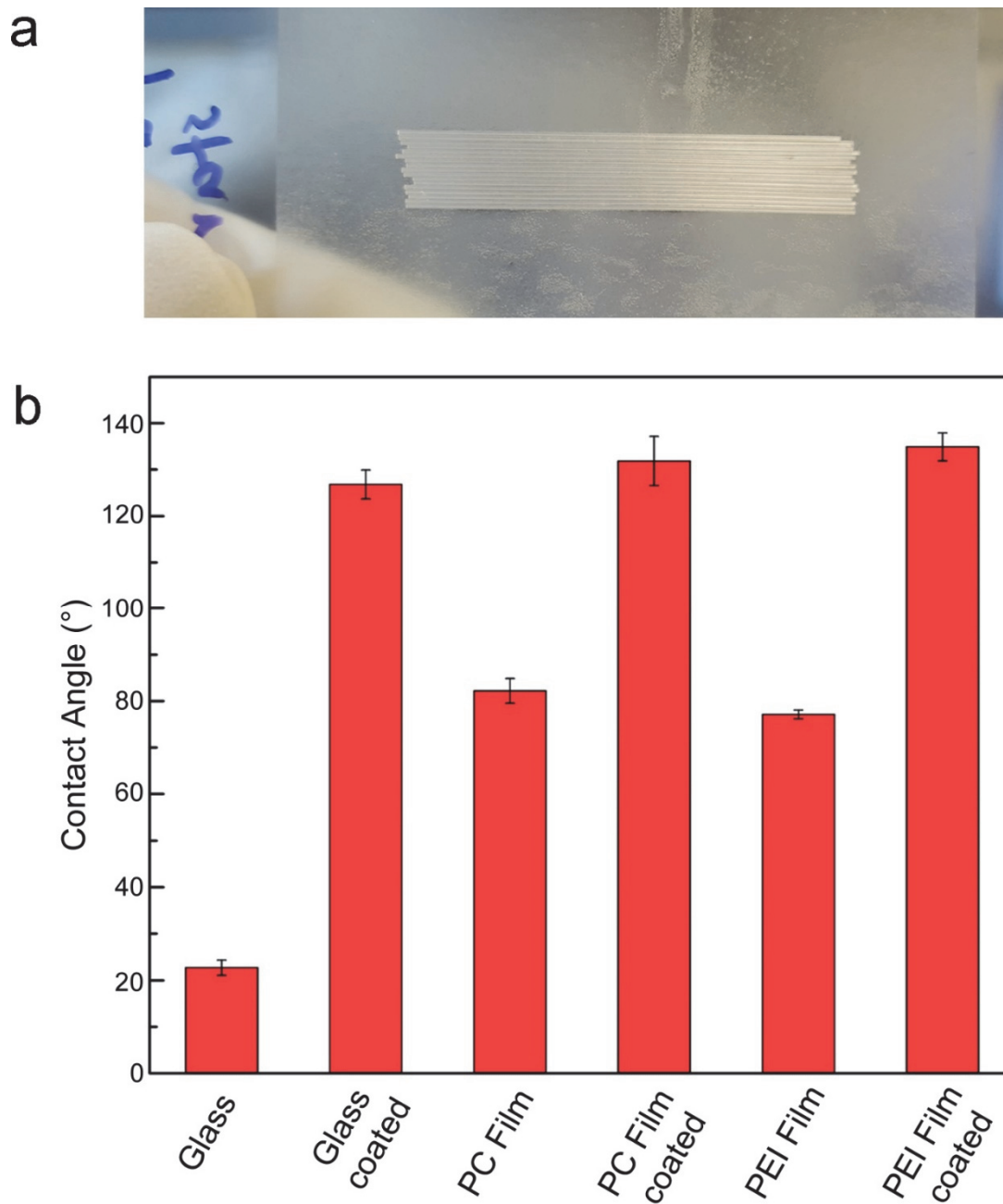


Figure S4. Model construction of surfaces for CA measurement on glass substrate using double sided tape (a), and CA values measurement on different substrates including glass, PC film, and PEI film and their coated surfaces (b).

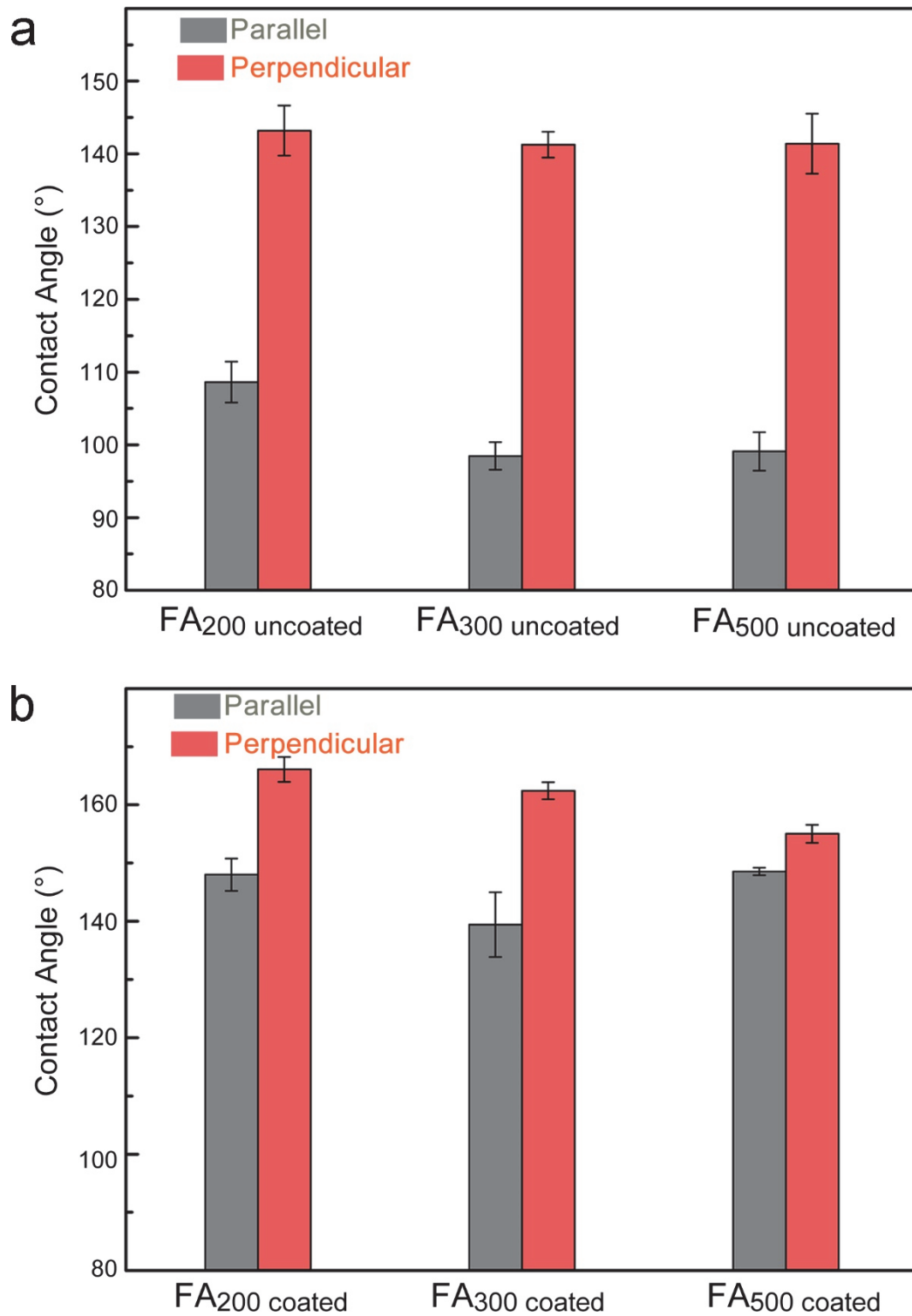


Figure S5. Comparison of groove dimension on the basis of anisotropic behavior. (a) Uncoated 200 μm , 300 μm , and 500 μm grooved PEI fiber arrays, and (b) coated 200 μm , 300 μm , and 500 μm grooved PEI fiber arrays.