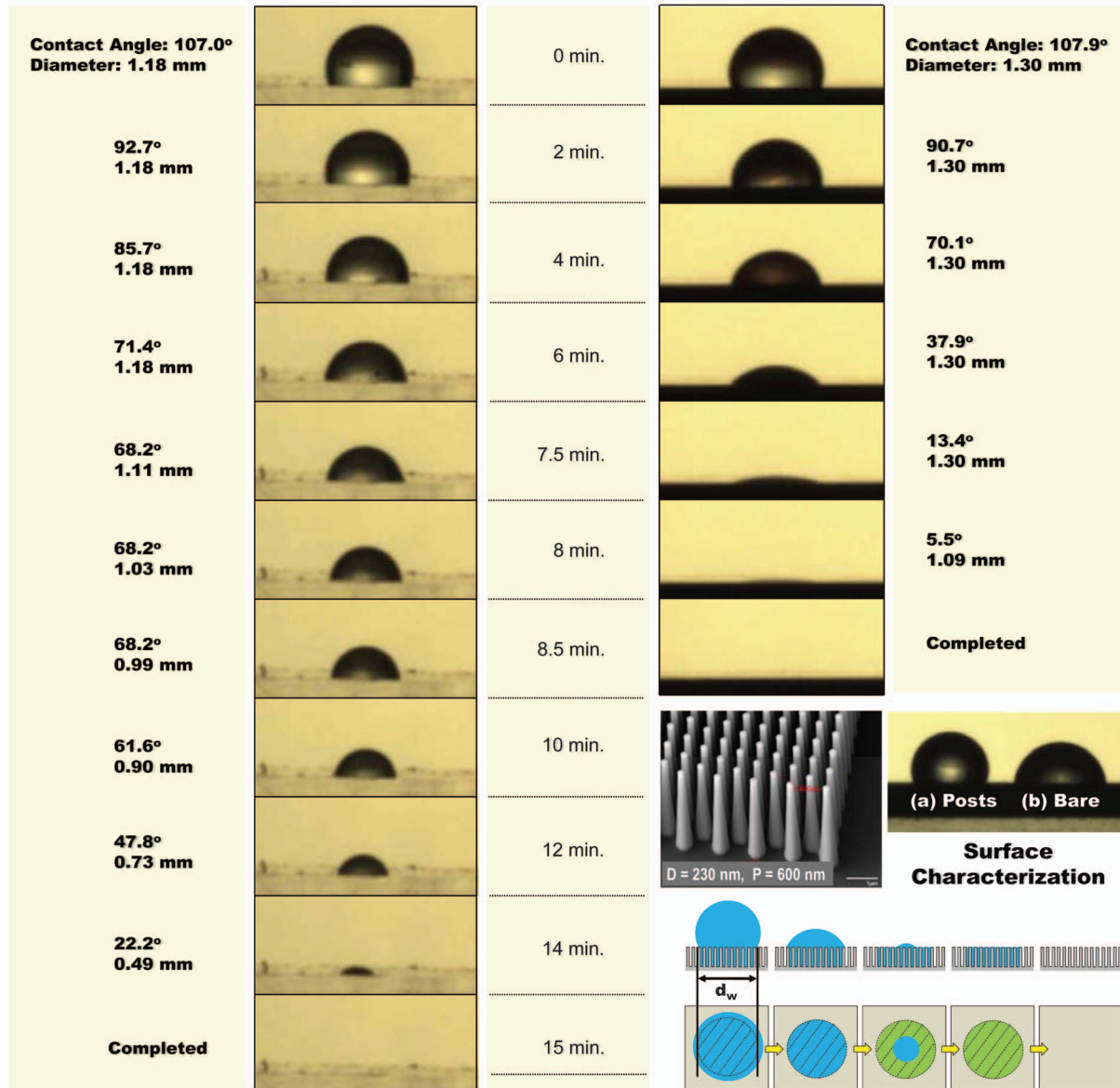


Droplet Evaporation

Non-patterned PDMS

Nano-patterned Post Array



Evaporation Characteristics of Sessile Droplets on Nano-patterned Hydrophobic Surfaces

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This study investigates the evaporating characteristics of 1 μ l water droplets on the hydrophobic surfaces of nano-diameter posts. The digital image analysis algorithm allowed us to obtain time-dependent contact angles, contact diameters, and center-heights for non-patterned PDMS surfaces and patterned silicon post array surfaces, which have the same hydrophobic contact angles. In the non-patterned surface case, the contact angles have three distinct stages during evaporation. However, in the patterned post array surface case, the contact angles decrease linearly. In the case of post array surfaces the initial wetting diameter remains unchanged until the portion of the droplet above the posts completely dries out. The edge shrinking velocity of the droplet shows nonlinear characteristics, and its magnitude becomes extremely large at the end of evaporation. Additionally it is observed that the droplet contact angle, predicted by Wenzel or Cassie & Baxter relations, are not agreeable for nano-post geometry.

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