

Abstract Submitted
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Technique for needle-free drop deposition: Pathway for precise characterization of superhydrophobic surfaces PRASHANT R. WAGHMARE, SIDDHARTHA DAS, SUSHANTA K. MITRA, Department of Mechanical Engineering, University of Alberta, Edmonton, Alberta, Canada T6G 2G8 — The most important step for characterizing the wettability of a surface is to deposit a water drop on the surface and measure the contact angle made by the drop on the surface. This innocuously simple process relies on bringing a needle holding the water drop in close proximity to the surface, with a “desire” that the drop would spontaneously detach from the needle and get deposited on the surface. Problem occurs when the surface is superhydrophobic, expressing an “unwillingness” to “see” the water drop in preference to a much more “water-loving” needle surface. There exists no solution to this problem, and surfaces are invariably characterized where the drop-needle assembly contacts the superhydrophobic surface. Such a configuration will always lead to an incorrect estimation of the contact angle, as there is no certainty of the existence of the drop-surface contact. Here we shall discuss our recently invented technique, where we solve this long-standing problem—we indeed ensure a needle-free drop in contact with the superhydrophobic surface, thereby ascertaining precise determination of the contact angle. The successful application of the technique will address a major headache of the big research community interested in science and technology of superhydrophobic surfaces.

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