Holographic Fabricaton of Switchable Superhydrophobic Micro-arrays using Top-cut Pyramid Microprism-arrays

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Inspired by the water-repellent behavior of the micro and nanostructured plant surfaces, superhydrophobic surfaces have received a lot of research attention. Also, surfaces with reversibly switchable wettability have aroused great interest because of their applications as biomolecular patterning, microfluidic devices, and so on. In this study, we reported a fabrication method for creating well ordered microarrays containing 3D nanostructured superhydrophobic surface. Those superhydrophobic microarrays were prepared by holographic lithography using top-cut pyramid microprisms, and reactive ion etching. In our work, the electrowetting effect was used as the activation mechanism for the switchable superhydrophobic surface. The superhydrophobic surface was resistant to the absorption of proteins, and once converted to a wetted state, the same surface promoted protein absorption. These switchable superhydrophobic surfaces enable the design of multicomponent protein arrays.