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# Continuous and Controlled Directional Water Transportation on a Hydrophobic/Superhydrophobic Patterned Surface

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## Abstract

Directional transportation of water flow, which is frequently seen in nature, is of not only great importance to organisms but also crucial demand for advanced science and technologies. Numerous contributions have been dedicated to the motion manipulation of single drops on chemically heterogeneous surfaces, which have hydrophilic/superhydrophobic patterns in general. Drop retention is therefore difficult to avoid due to the hydrophilic regions, and continuous transportation of water flow still remains a challenge. Here, a hydrophobic/superhydrophobic patterned surface, featured with chemical homogeneity, is developed via a simple coating on a morphologically heterogeneous surface. Such surface can guide the continuous water motions, and relationship between the surface patterns and the motion controllability is clarified. Additionally, the potential application of the patterned films is explored as a micro-mixing device for different drops. The finding and results are essential for advancing more applications of microfluidics and microchips.

**Keywords:** hydrophobic/superhydrophobic; chemically homogeneous; patterned surface; directional transportation

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