스마트한 물방울 청소부, Marangoni 효과를 이용한 초소수성 표면에 대한 연구

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We propose a simple method without any fluorinated chemistry to fabricate superhydrophobic surface with exceptional liquid repellency, transportation of oil, selective capture of oil, optical bar code, and self-cleaning. Here we show experimentally that evaporation of ethanol can be used to form superhydrophobic surface driven by marangoni instability. This method presents in-situ photopolymerization in the presence of ethanol and porous PDMS cover to fabricate superhydrophobic surfaces with the desired combination of micro- and nanostructure. The porous PDMS cover significantly affects Marangoni instability to coating solution, inducing composition gradients at the same time. In addition, the change of concentration of ethanol is able to produce versatile surfaces from hydrophilic to superhydrophobic. It can be easily confirmed to measure contact angles and as roughness factors. In conclusion, the control of ethanol evaporation under the polymerization provides a convenient parameter to fabricate the superhydrophobic surface.