

Facile fabrication of a superhydrophobic sponge for selective absorption of oil from a water surface

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Fabrication of superhydrophobic porous materials is highly important for removing oil from water. To fabricate superhydrophobic and superoleophilic sponges, a superhydrophobic polysiloxane layer was coated onto a porous polyurethane sponge using immersion method. Polyurethane sponge is a porous material and shows physical absorption; hence, it is used to clean various surfaces. This sponge also has an excellent absorption capacity. However, sponges can also absorb water while absorbing oil from water. For selective oil separation, we developed a facile method to fabricate superhydrophobic and superoleophilic sponges coated with polysiloxane. The durability of the modified sponges was studied by a compression test. The dual properties of superhydrophobicity and superoleophilicity enable the modified sponge to absorb oil selectively from water. The absorbed oil can be collected by squeezing and the recovered sponge can be reused for oil-water separation. This is quite a helpful procedure for oil disposal in order to prevent secondary pollution. It can be developed into a simple and low-cost procedure for large-scale fabrication of superhydrophobic porous materials that can be used to clean polluted water.

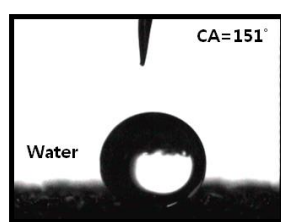


Fig 1. Optical image and contact angle of water droplet on the coated sponge

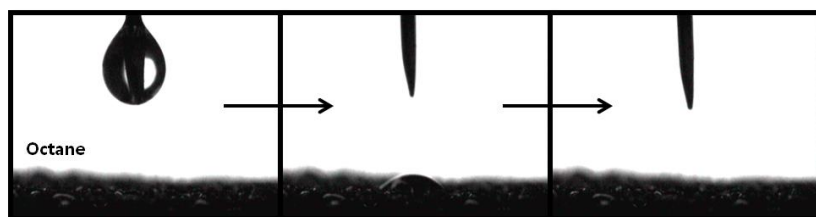


Fig 2. Optical images of octane droplets on the coated sponge