

2P114 Surface Mimicking Fish Scale of Cellulose Nanofiber for Oil Water Separation

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Regenerated cellulose sponge coated with cellulose nanofiber produced from the mechanical counter collision (MCNF) and TEMPO-oxidized (TCNF) was investigated for oil-water separation application. The surface wettability of cellulose nanofiber (CNF) under air and underwater condition showed that MCNF and TCNF have under air amphiphilic and underwater superoleophobic properties. These properties are similar to a fish scale that repel oil and absorb water so that maintain the surface always clean. TCNF has higher underwater oleophobicity compared to MCNF because TCNF absorbs more water than MCNF. However, oil-water separation test showed that TCNF membrane has a lower flow rate than MCNF membrane. The flow rate of MCNF membrane and TCNF membrane was $3730 \text{ L m}^{-2} \text{ h}^{-1}$ and $166 \text{ L m}^{-2} \text{ h}^{-1}$, respectively, both at a separation efficiency level higher than 99% by gravitational force alone.

Keywords: Cellulose nanofiber, underwater oleophobic, fish scale mimicking, oil-water separation

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