

Hierarchical Rough Surfaces Formed by LBL Self-assembly for Oil/Water Separation

Xiaoyu Li, Dan Hu, Kun Huang, and Chuanfang Yang*

Key Laboratory of Green Process and Engineering, Institute of Process Engineering,
Chinese Academy of Sciences, Beijing 100190, China

* Corresponding author.

Tel/Fax: +86 10 82544976.

E-mail: cfyang@home.ipe.ac.cn

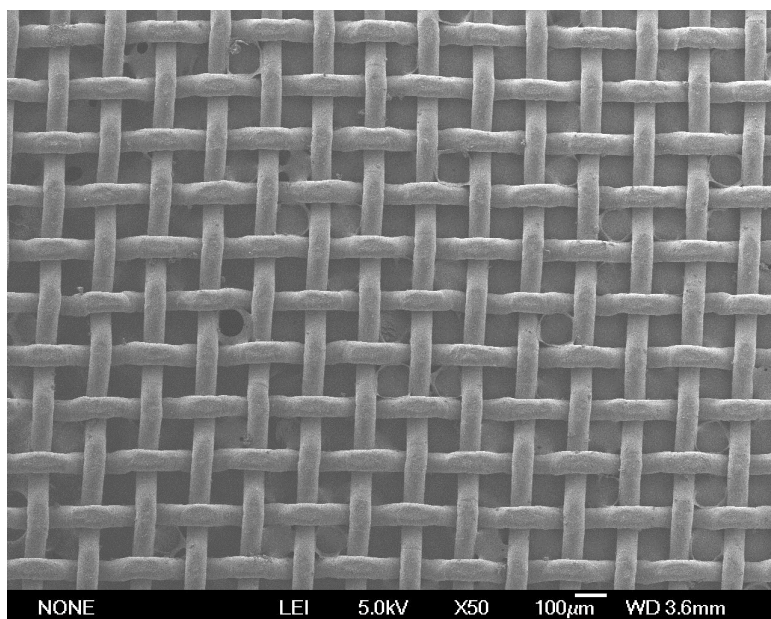


Figure S1. SEM image of stainless steel mesh.

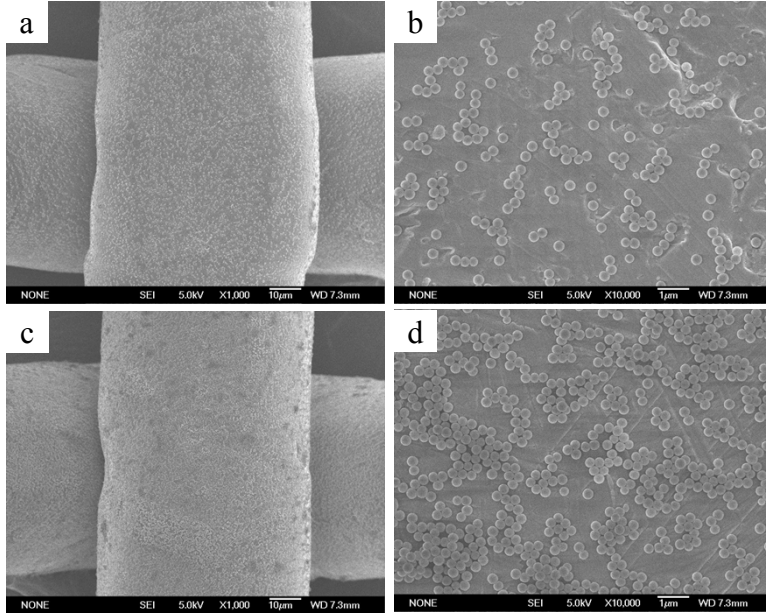


Figure S2. SEM images of stainless steel mesh coated with 250 nm nanoparticles by one (a,b) and two (c,d) assembling cycles

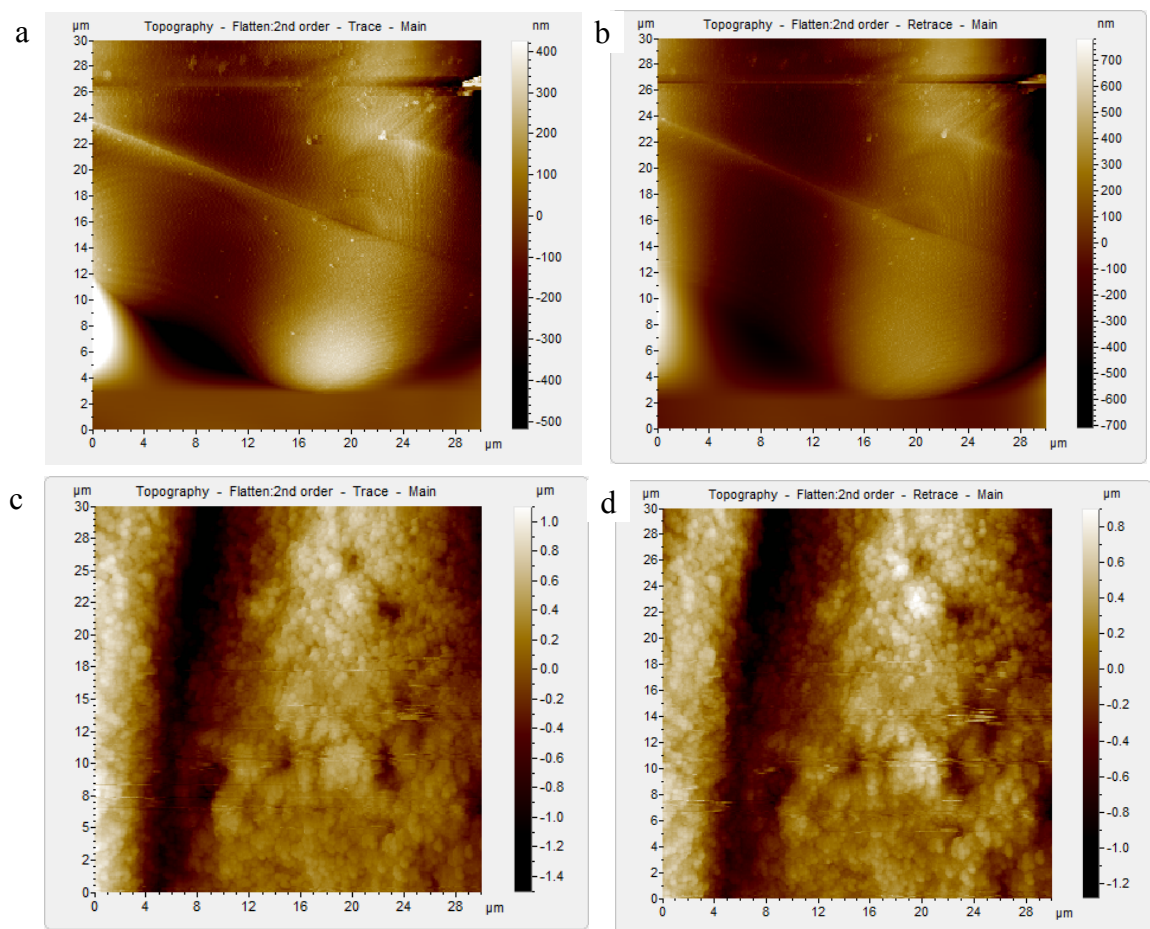


Figure S3. AFM images of the blank mesh (a,b) and the mesh with 3+1 deposition cycles plus hydrophobic modification (c,d). (n+m denotes n deposition cycles of 250 nm nanoparticles and m deposition cycles of 25 nm SiO₂ nanoparticles to form the bilayer on the mesh surface. a and c are the trace signal imaging, b and d the retrace imaging).

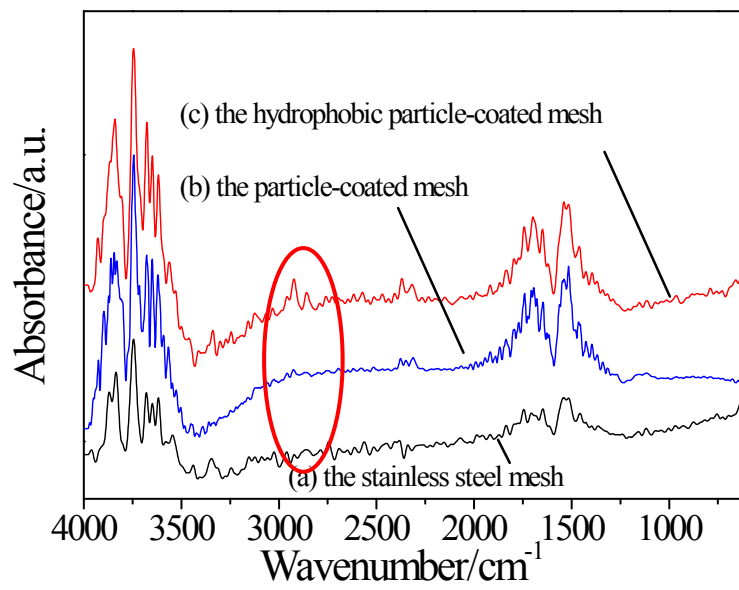


Figure S4. ATR-IR spectrum of blank stainless steel mesh (a), the mesh with 3+1 coating before (b) and after (c) hydrophobic modification.

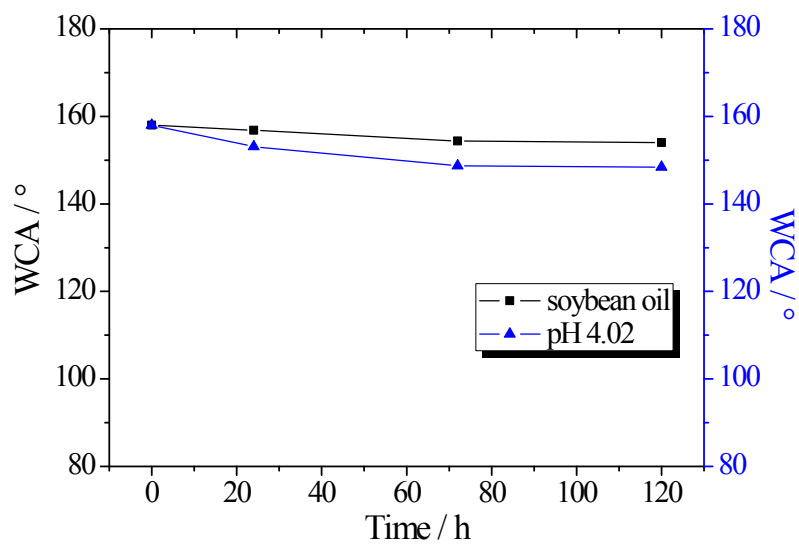


Figure S5. Variation of water contact angle (WCA) on the mesh with both particle coatings and hydrophobic modification subject to immersion into soybean oil and hydrochloric acid solution (pH 4.02) for different times.

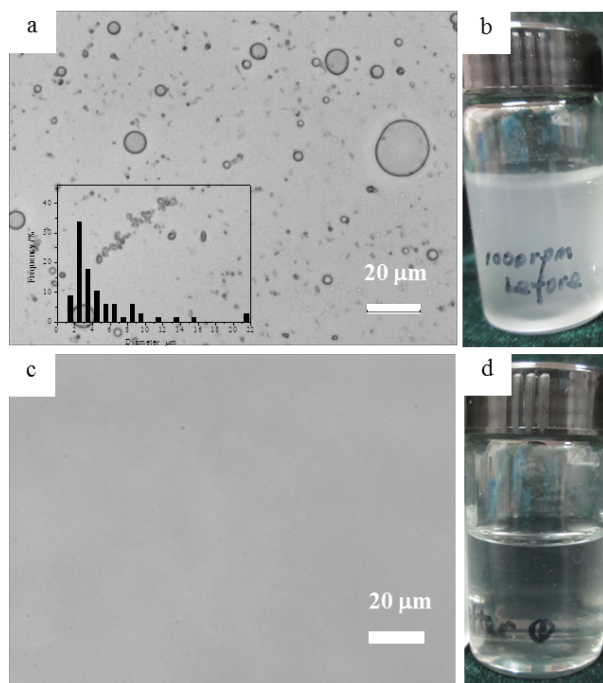


Figure S6. Features of the original emulsion (a-b) and emulsion filtered by the felt with 2+1 deposition cycles plus hydrophobic modification (c-d).

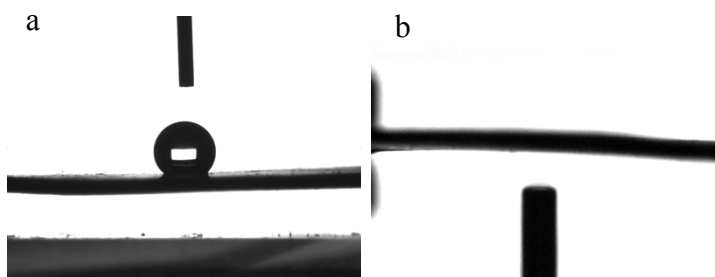


Figure S7. Digital images of WCA in air (a) and OWA under water (b) on the felt with 2+1 deposition cycles plus hydrophobic modification.

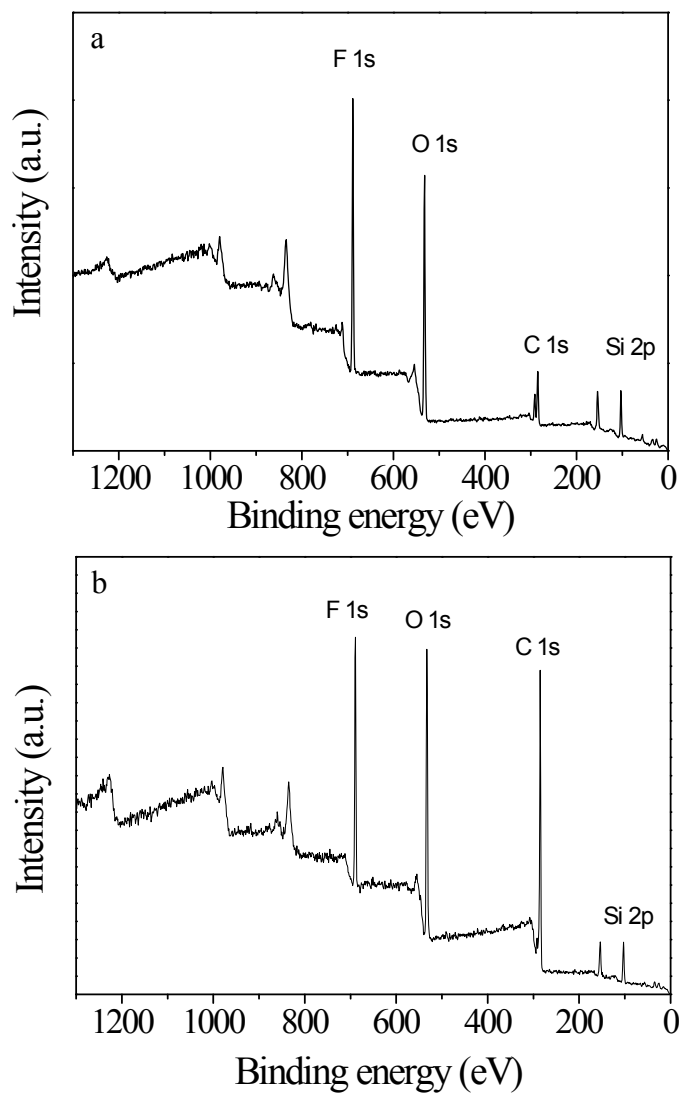


Figure S8. XPS spectrum of the felt with both particle coatings and hydrophobic (POTS) modification as prepared (a), and after 20 times use for oil/water emulsion separation followed by thorough washing (b).