

Supplementary Information for High-flux Superoleophobic Hybrid Membranes for Effective Oil-Water Separation from Oil-contaminated Water

Minxiang Zeng,^a Baoliang Peng,^{b,c} Carlos Ybanez,^a Eric Bordovsky,^a Nutchapol Dendumrongsup,^d Nian Wei Tan,^d Andrew Nguyen,^a Chang-Hyun Choi,^a Alan Ye,^d Ian Echols,^a Ehab Abo Deeb,^e Lecheng Zhang,^a Jianhui Luo,^{b,c} Pingmei Wang,^{b,c} Dali Huang,^f Yue Situ^{a,g} and Zhengdong Cheng^{a,f,h*}

^aDepartment of Chemical Engineering, Texas A&M University, College Station, TX 77843, USA.

^bResearch Institute of Petroleum Exploration & Development (RIPED), PetroChina, Beijing 100083, China;

^cKey Laboratory of Nano Chemistry (KLNC), CNPC, Beijing 100083, China;

^dDepartment of Petroleum Engineering, Texas A&M University, College Station, TX 77843, USA.

^eDepartment of Civil Engineering, Texas A&M University, College Station, TX 77843, USA.

^fDepartment of Material Science & Engineering, Texas A&M University, 3003 TAMU, College Station, TX 77843, USA.

^gSchool of Chemistry and Chemical Engineering, South China University of Technology, Guangzhou 510640, P. R. China.

^hProfessional Program in Biotechnology, Texas A&M University, TX 77843, USA. E-mail: zcheng@tamu.edu. Tel.: +1-(979)845-3413, Fax: +1-(979)845-6446.

This Supplementary Information section contains:

Figure S1. FTIR of oil-in-CCl₄ with different volume fraction.

Figure S2. Correction coefficient curve for heptane.

Video S1. Demonstration of oil-water separation: Water (dyed blue) can easily penetrate through the hybrid membrane whereas oil (heptane, dyed red) is blocked. 0.5 wt% of SDS was used to emulsify oil into emulsion prior to the separation experiments. (Please see separate video file)

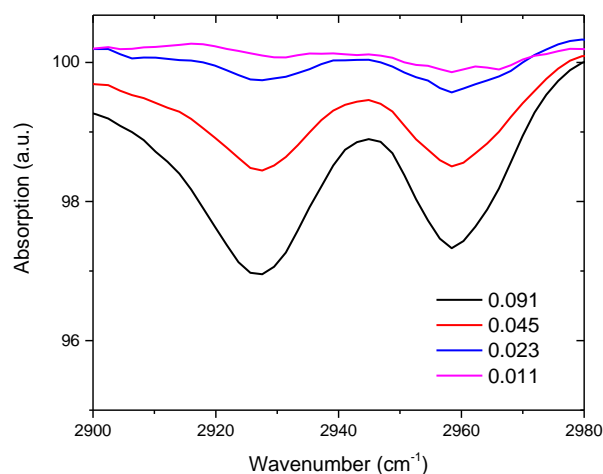


FIGURE S1. FTIR of oil-in- CCl_4 with different concentration (v/v). Upon increasing oil concentration, one can observe a clear increasing trend of absorption at near 2930 cm^{-1} . This peak can be attributed to C-H stretching signal for alkane.

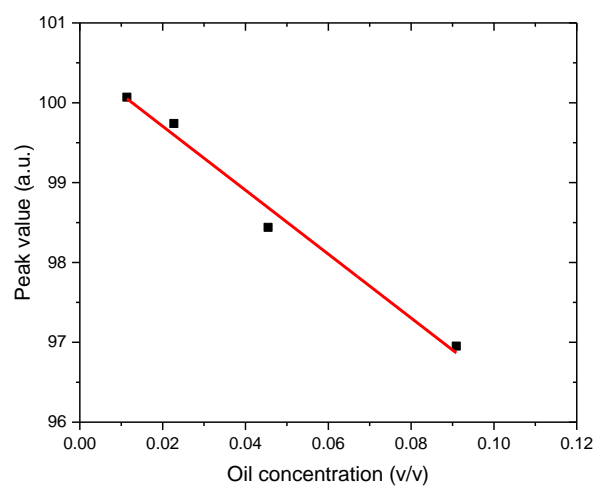


FIGURE S2. Correction coefficient curve for heptane with a slop of -40.03 and an intercept of 100.51 . The intercept is not exactly 100 due to the machine baseline of FTIR. This correction coefficient was used for heptane based oil-separation efficiencies, whereas correction coefficients of other oils, such as toluene, ethyl acetate, and crude oil, were still made respectively.