SORPPORTING INFORMATION

Hydrophilic nanofibrous composite membrane prepared by melt-blending extrusion for effective separation of oil/water emulsion

Dandan Xu, Xiaoting Zheng, Ru Xiao*

State Key Laboratory for Modification of Chemical Fibers and Polymer Materials, College of Materials Science and Engineering, Donghua University, Shanghai 201620, P. R. China

Correspondence to: Ru Xiao (E-mail: xiaoru@dhu.edu.cn)



Fig. S1 SEM images of surface morphology of EVOH nanofiber membrane



Fig. S2 FT-IR spectroscopy of (a) EVOH nanofiber membrane, (b) NCC, (c) NCC/EVOH nanofiber composite membrane (N-4)

The characteristic chemical components of the three related substance in this study form the FTIR were shown in Figure S2. As compared to the EVOH nanofiber membrane which consisted of pure EVOH, the FTIR spectrum of N/E-NCM showed

a few new peaks. The wide peak at $3700 \sim 3200 \text{ cm}^{-1}$ belongs to the –OH stretching vibration in the cellulose macromolecule. The peak at 2900 cm⁻¹ belongs to the -CH stretching vibration of the cellulose macromolecule, and the peak at 1060 cm⁻¹ was assigned to –OH and C-O-C stretching vibration in the cellulose macromolecule. The FTIR spectrum of the N/E-NCM was similar to that of the NCC, indicating that when the amount of NCC higher than 30 mg/cm³, the top NCC layer would cover the EVOH nanofiber membrane. The peak at 3320 cm⁻¹ belonging to –OH stretching vibration of EVOH nanofiber membrane turned to the smaller number due to the hydrogen bond between EVOH nanofiber membrane and NCC, which made the contribution to the stable of N/E-NCM.



Fig. S3 The UV absorption-concentration curve of oil-water emulsion

The UV standard curve for oil-water emulsion was presented in Figure S3. The linear fitting equation was list as followed.

(1)

where y is the absorbance A, x is the oil-water emulsion concentration C. According to the equation, the absorbance increased linearly with the concentration.



Fig. S4 the SEM image of surface morphology of commercial membrane



Fig. S5 Contact angel images of commercial membrane