

Electronic Supplementary Information (ESI)

Switchable fluorescent AIE-active nanoporous fibers for cyclic oil adsorption

Wei Yuan,^a Pei-Yang Gu,^b Cai-Jian Lu,^b Ke-Qin Zhang,^{*a} Qing-Feng Xu^{*b} and Jian-Mei Lu^{*b}

^a National Engineering Laboratory for Modern Silk; College for Textile and Clothing Engineering, Soochow University, Suzhou 215123, PR China; E-mail: kqzhang@suda.edu.cn

^b College of Chemistry, Chemical Engineering and Materials Science; Key laboratory of Absorption technology for Wastewater Treatments in Petroleum and Chemical Industry, Soochow University, Suzhou 215123, PR China; Email: xqingfeng@suda.edu.cn; lujm@suda.edu.cn

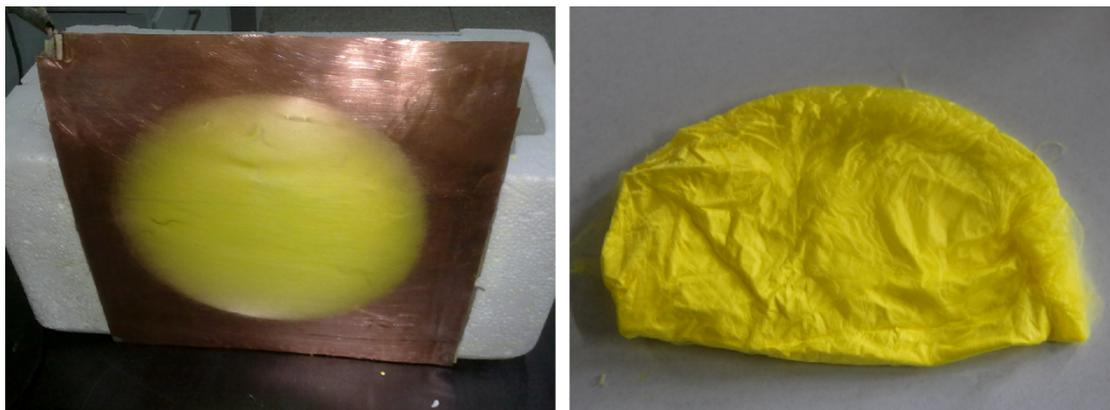


Figure S1. The PMMA porous fibers can be mass-produced via electrospinning method. The yellow membrane of porous fibers was deposited on the metallic collector, as shown on left. On right, the membrane was removed from the metal plate by peeling.

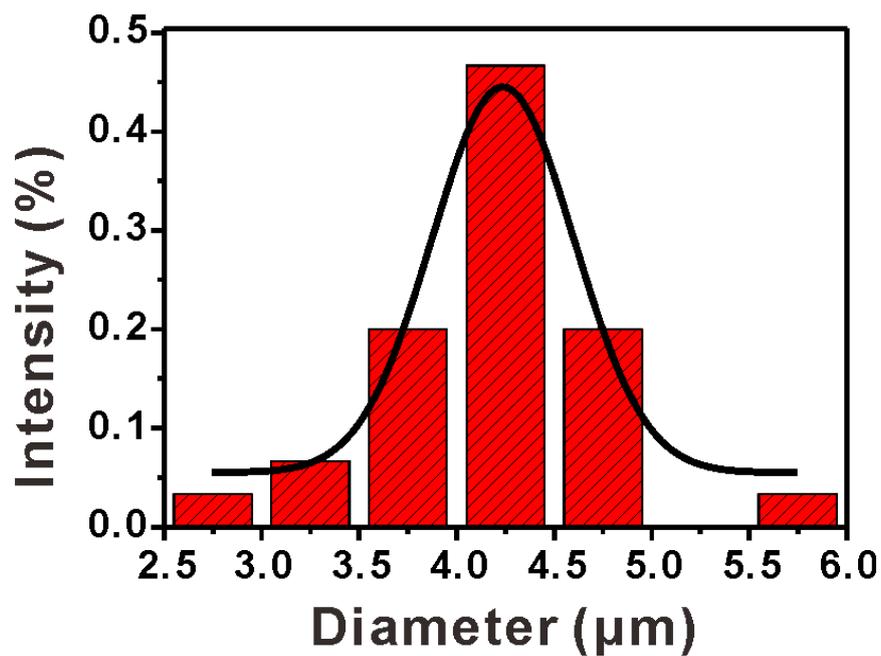


Figure S2. Size distribution of the diameters of the electrospun PMMA porous fibers. The average diameter is $4.2 \pm 0.56 \mu\text{m}$.

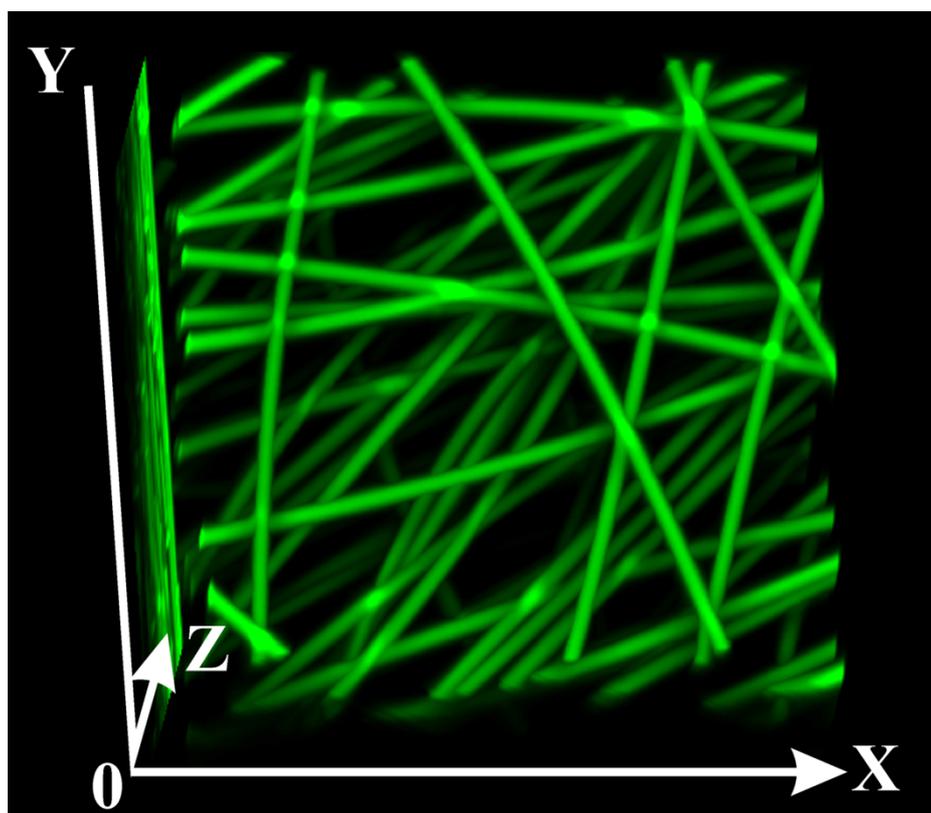


Figure S3. Three-dimensional reconstructions of the fluorescent image of PMMA porous fibers captured by laser confocal microscope.

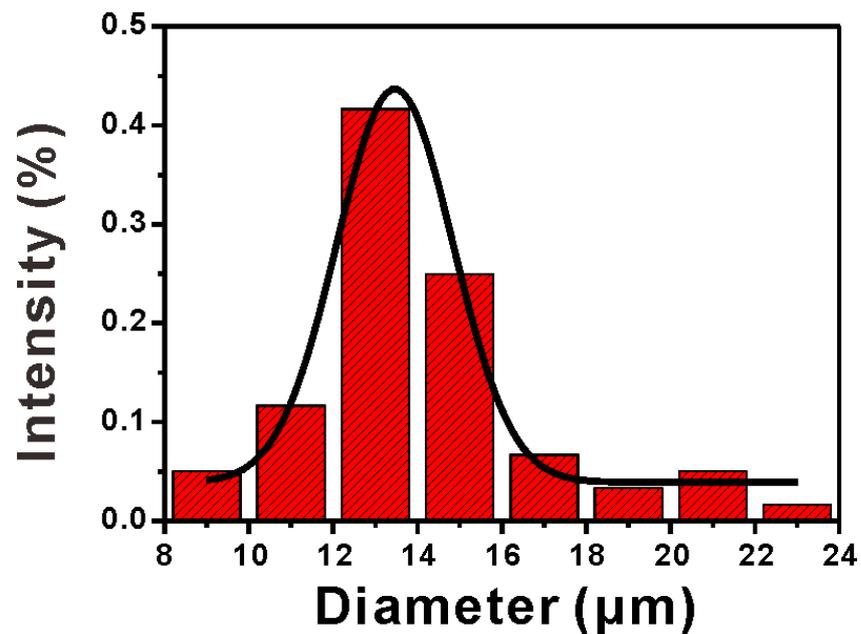


Figure S4. Size distribution of the diameters of the PMMA solid fibers. The average diameter is $14.1 \pm 2.85 \mu\text{m}$ with concentration of 25 wt%.

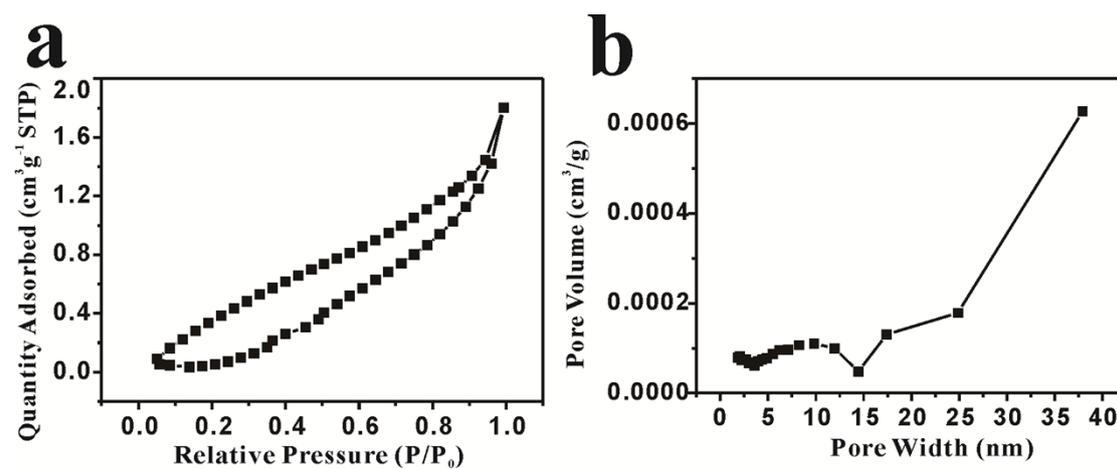


Figure S5. (a) Nitrogen adsorption-desorption isotherms and (b) pore size distribution curves of PMMA solid fibers.

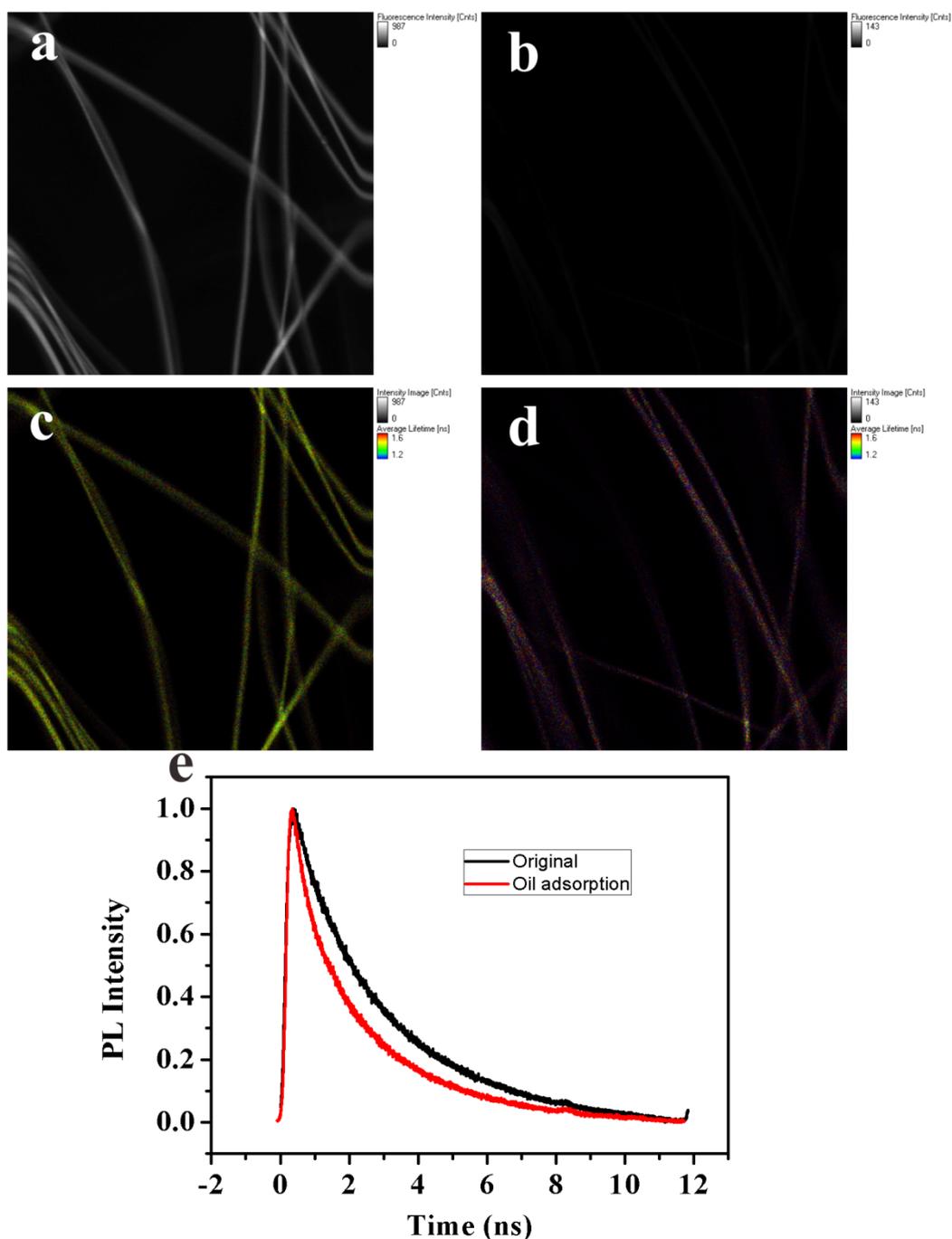


Figure S6. Fluorescence lifetime imaging microscopy analysis of the PMMA porous fibers before and after oil adsorption. Fluorescence intensity images of PMMA porous fibers (a) before (b) and after oil adsorption. Fluorescence lifetime images (FILM) of PMMA porous fibers (c) before (d) and after oil adsorption. (e) Typical fluorescence decay curves associated with lamp profiles of PMMA porous fibers before and after oil adsorption.

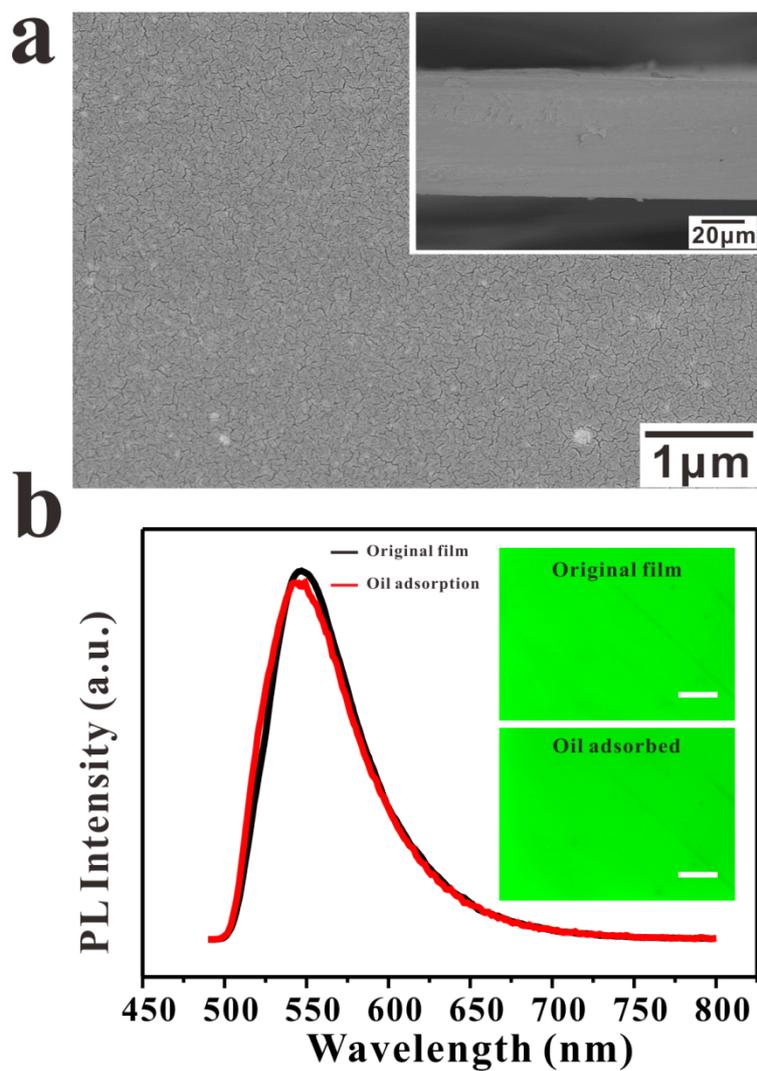


Figure S7. (a) SEM images of surface and cross section of PMMA solid film. (b) PL spectra of PMMA solid film before and after silicon oil immersion and the corresponding images under the fluorescent microscope. The scale bars are $100\ \mu\text{m}$.

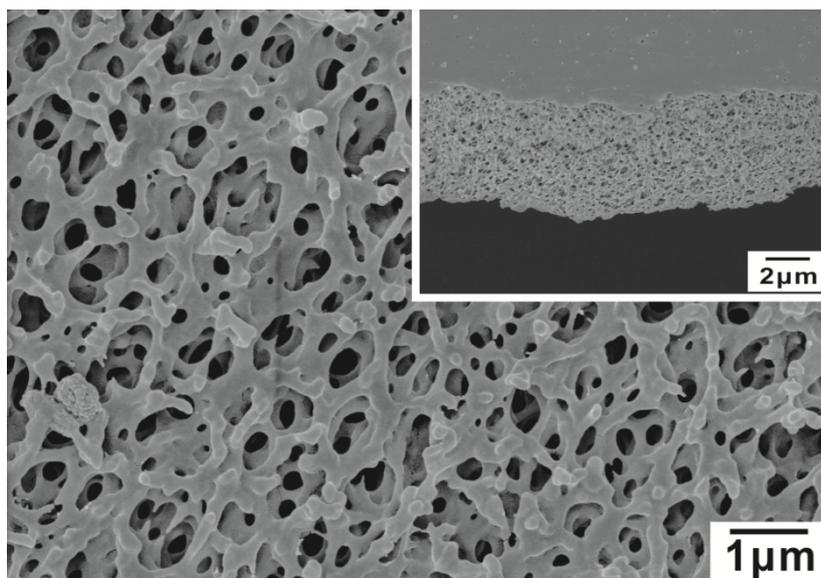


Figure S8. SEM images of surface and cross section of PMMA porous film.

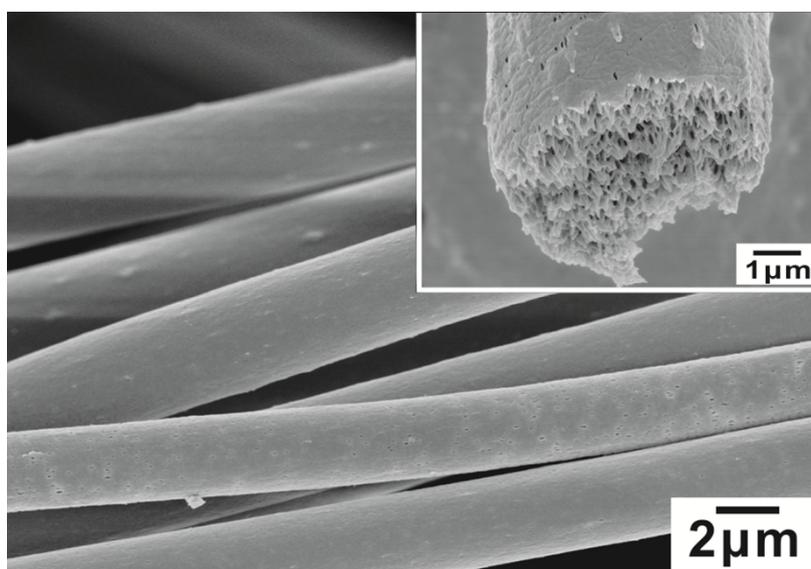


Figure S9. SEM images of surface and cross section of PMMA/TPP-NI composite porous fiber. The concentration of the pure PMMA was 30 wt% and the weight ratio of TPP-NI to PMMA was 1: 100.

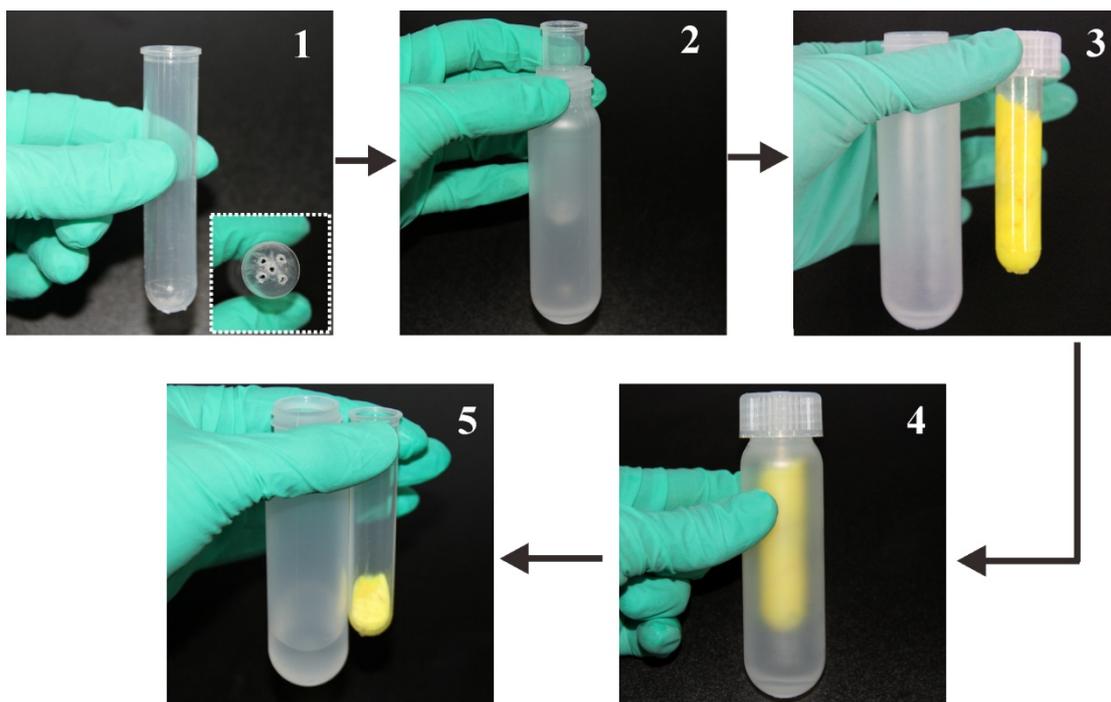


Figure S10. Detailed experimental procedures of oil recycle from PMMA porous fibers after oil adsorption by centrifugation.

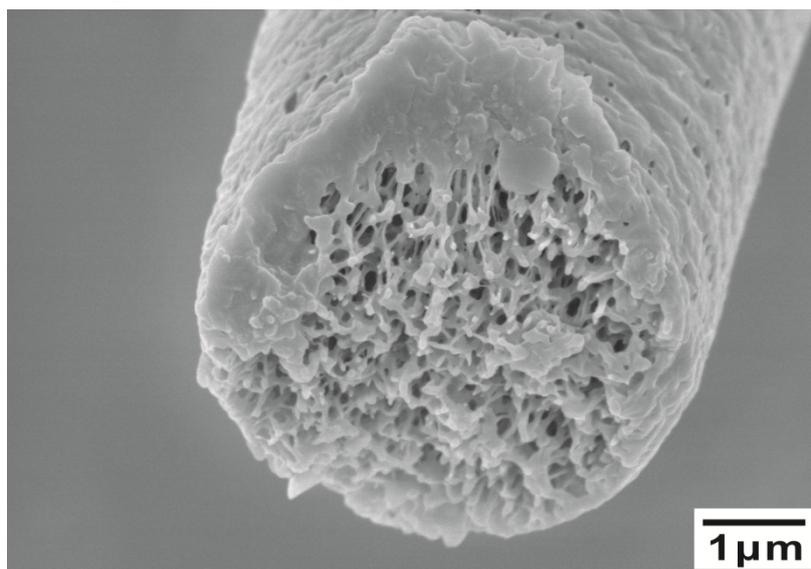


Figure S11. SEM image of cross section of PMMA porous fiber after 2 cycles of adsorption and desorption.

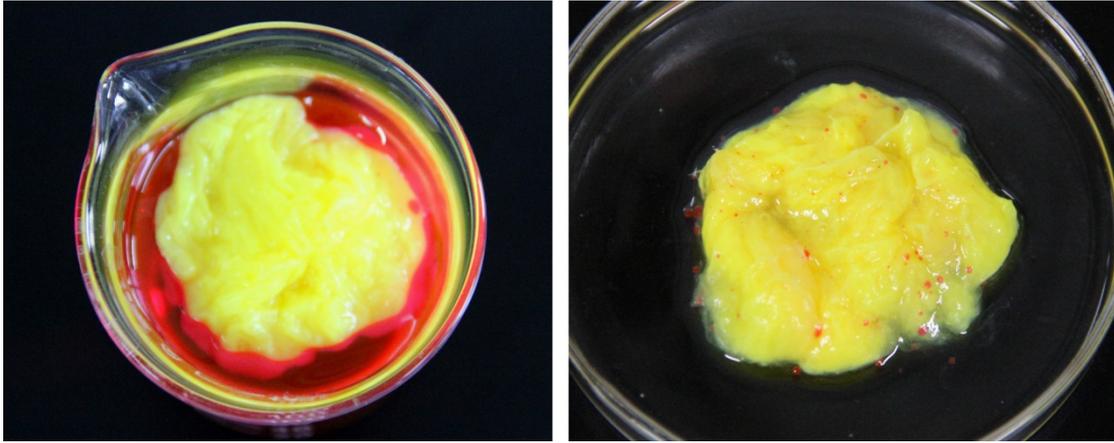


Figure S12. Photos of the swelling behavior of the squeezed PMMA porous fibers by centrifugation after 2 cycles of oil adsorption and desorption.

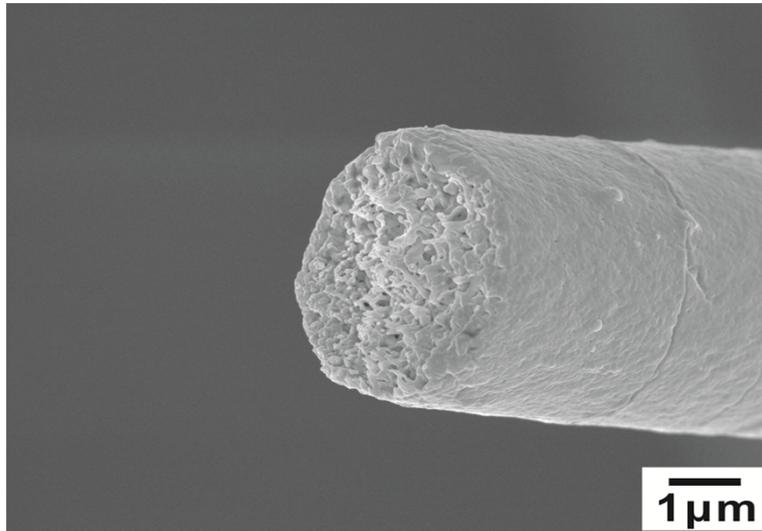


Figure S13. Micrograph of the destroyed PMMA porous fiber after 5 cycles of oil adsorption and desorption.

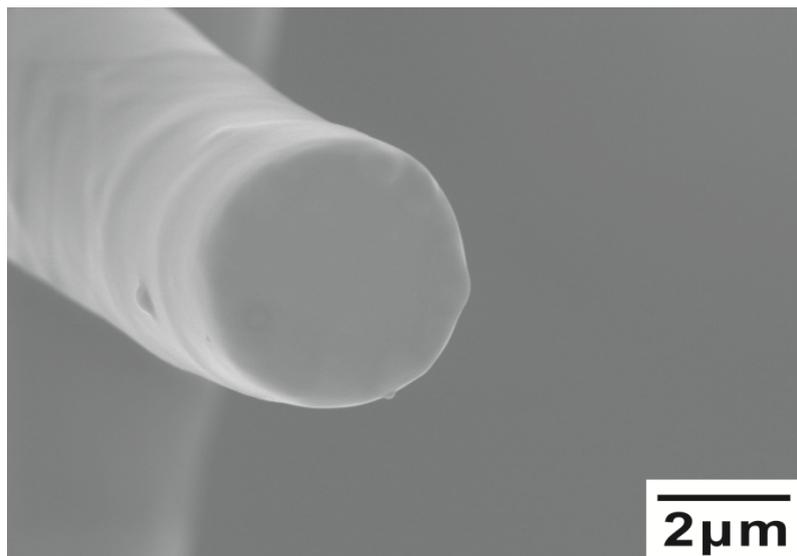


Figure S14. Micrograph of the destroyed PMMA porous fiber after 6 cycles of oil adsorption and desorption.