Electronic Supplementary Information

Robust Superhydrophobic Carbon Nanofiber Network Inlay-Gated Mesh for Water-in-Oil Emulsion Separation with High Flux

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Table S1. Typical robust superhydrophobic membranes with mechanical abrasion resistance for regular oil-water separation.

Membrane structure	Durability principle	Wettability	Separation form	Ref.
PDMS graphdiyne-grown copper foam	3D foam support	Superhydrophobic	Regular separation	[1]
Sodium polyacrylate-grafted PVDF copper mesh	Robust polyionized hydrogel coating	Underwater superoleophobic	Regular separation	[2]
Oligomer-wrapped TiO2 nanoparticles coated paper	Hierarchical structure and interface adhesion	Superhydrophobic	Regular separation	[3]
Poly[(3,3,3-trifluoropropyl)methylsiloxane] aggregation mesh	Adhesion and elasticity of coatings	Superhydrophobic	Regular separation	[4]
Polyaniline-fluorinated alkyl silane coated cotton fabric	3D textile support	Superhydrophobic	Regular separation	[5]
Polyester mesh/PFDTS/Si nanoparticles with PFOTS	Polyester mesh structure	Superhydrophobic	Regular separation	[6]
SSM/glue/$CaCO_3$-1H,1H,2H,2H-perfluorooctyltriethoxysilane	Adhesive effect and robust paint	Superhydrophobic	Regular separation	[7]
SSM/PDDA/SiO_2/PDDA/fluoro surfactant layer	PDDA binder layer effect for SiO_2 anchor	Superoleophobic	Regular separation	[8]

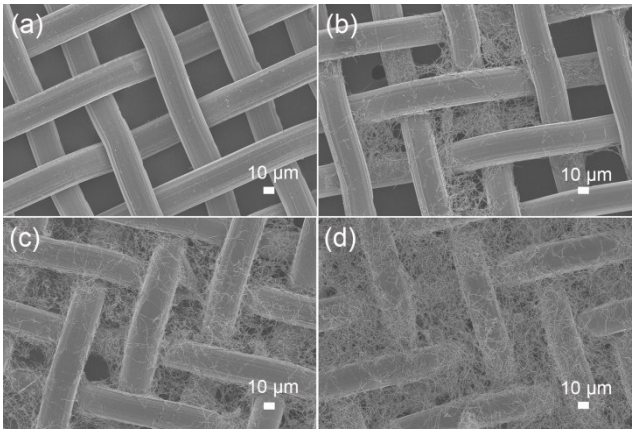

Fig. S1. FE-SEM morphology of as-prepared SSM/CNFs-PDMS membranes with various coverage using different amount of carbon nanofibers. (a) original SSM membrane with 0 mg CNFs, (b) 0.5 mg CNFs, (c)1 mg CNFs, (d) 1.5 mg CNFs.

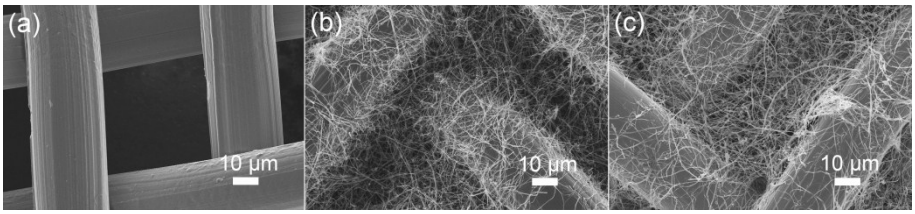

Fig. S2. Characterization of SSM/CNFs-PDMS composite membrane in lower magnification. (a) FE-SEM image of pristine SSM, (b) FE-SEM image of SSM/CNFs composite membrane, (c) FE-SEM image of SSM/CNFs-PDMS composite membrane.

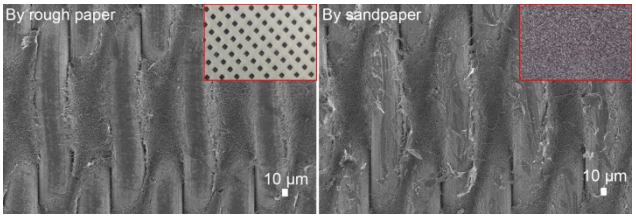

Fig. S3. FE-SEM images of abraded 1000 sized mesh-based network-inlay gated membranes by different substrates, rough paper and sandpaper, respectively.

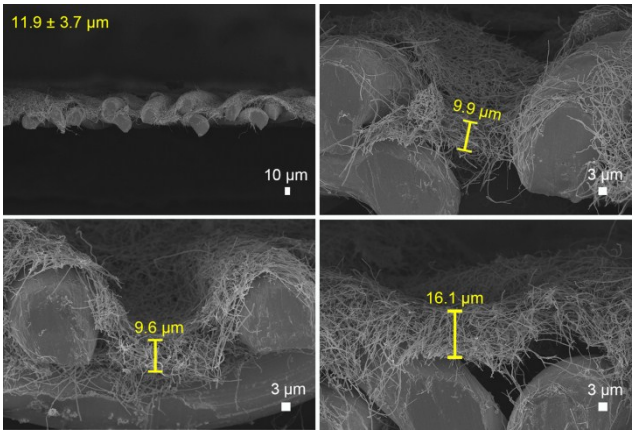

Fig. S4. Membrane thickness measured by cross-sectional FE-SEM images.

Fig. S5. The photographs of device for water-in-toluene emulsion separation, including original emulsions, as-prepared membrane, membrane support, and separated emulsions.

References

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