Supporting Information

A facile and mild strategy to fabricate underwater superoleophobic and underoil superhydrophobic mesh with outstanding anti-viscous oil-fouling property for switchable high viscosity oil/water separation

Jin Zhang,[a] *Lu Zhang,*[a] *Jianguo Zhao,*[a] *Wenshan Qu,*[a] *and Zhenxing Wang**[b]

[a] Institute of Carbon Materials Science, Shanxi Datong University, Datong, Shanxi Province, 037009, PR China.

[b] College of Chemistry, Nanchang University, Nanchang 330031, P. R. China.

*E-mail: wzx_1009@163.com

Video 1: Soybean oil (dyed red) can not adhere on the Iron mesh-MNS-PDA/PEI (under water).

Video 2: The crude oil spontaneously levitates o□ the membrane surface once the Iron mesh-MNS-PDA/PEI is immersed in water. The Iron mesh-MNS-PDA/PEI was prewetted by water.

Video 3: When the Iron mesh-MNS-PDA/PEI is immersed in a crude oil/water mixture, the Iron mesh-MNS-PDA/PEI is free of oil fouling and kept clean underwater.

Video 4: Soybean oil (dyed red) can adhere on the pristine iron mesh (under water).

Video 5: The crude oil cannot spontaneously levitate o□ the membrane surface once the pristine iron mesh is immersed in water. The iron mesh was prewetted by water.

Video 6: When the pristine iron mesh is immersed in a crude oil/water mixture, the iron mesh is seriously adhered and fouled by crude oil without self-cleaning capability underwater.

Video 7: During the gravity-driven separation process, the water permeates through the Iron mesh-MNS-PDA/PEI quickly, while soybean oil could remain stable on the mesh. The mesh was prewetted by water before use.

Video 8: During the gravity-driven separation process, the dichloroethane (dyed red) permeates through the Iron mesh-MNS-PDA/PEI quickly, while water could remain stable on the mesh. The mesh was prewetted by dichloroethane before use.

Video 9: A dual-channel oil/water separation system can realize the continuous separation of crude oil/water mixture. The Iron mesh-MNS-PDA/PEI on the one side of the system was prewetted by water, the other was prewetted by crude oil.

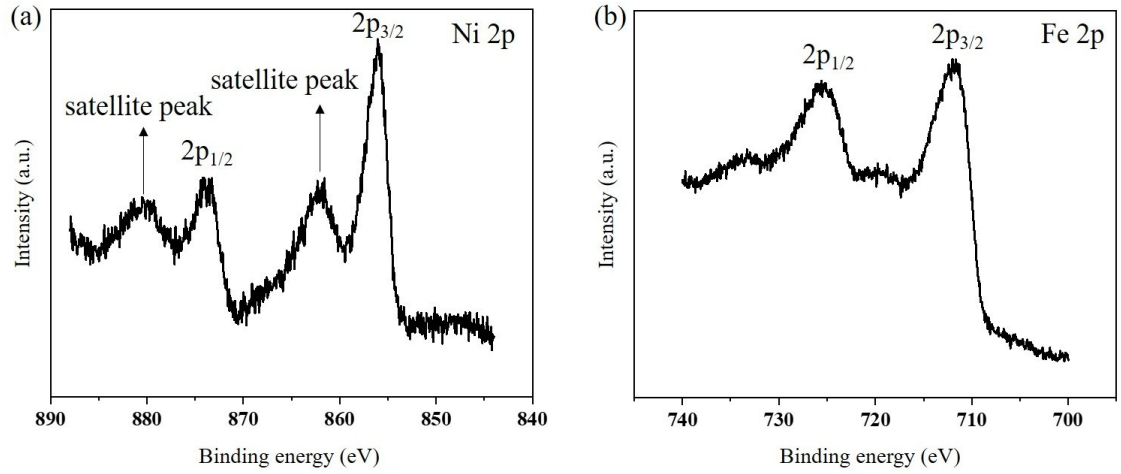

Fig.S1 (a)Ni 2p and (b)Fe 2p core level XPS specatra of the iron mesh-MNS.

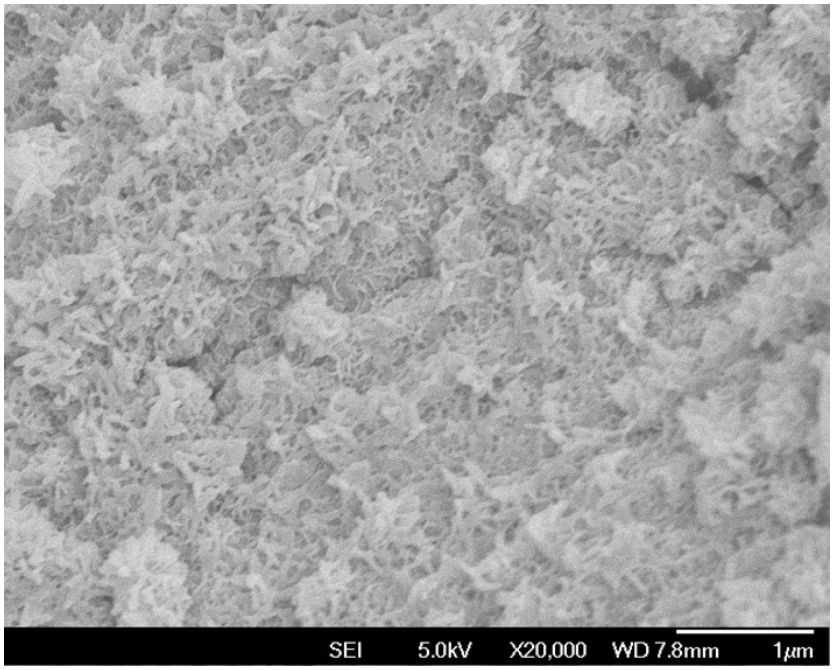

Fig.S2 SEM image of the iron mesh-MNS after being immersed in acid solution (pH=4) for 2h.

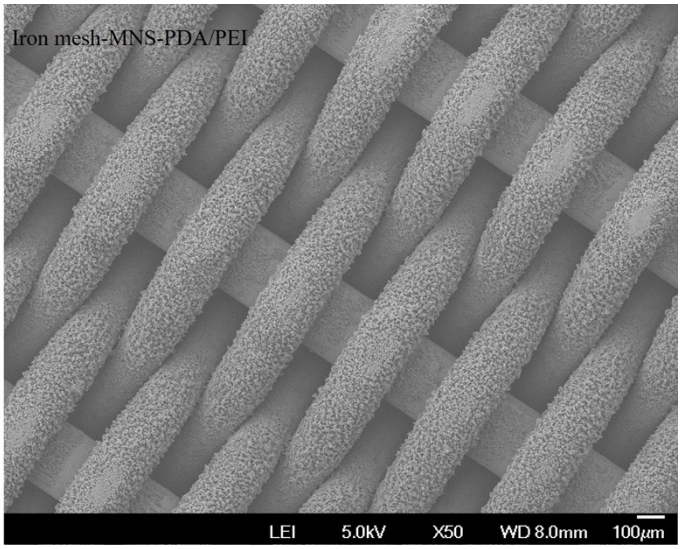

Fig.S3 SEM image (low-magnification) of the iron mesh-MNS-PDA/PEI.

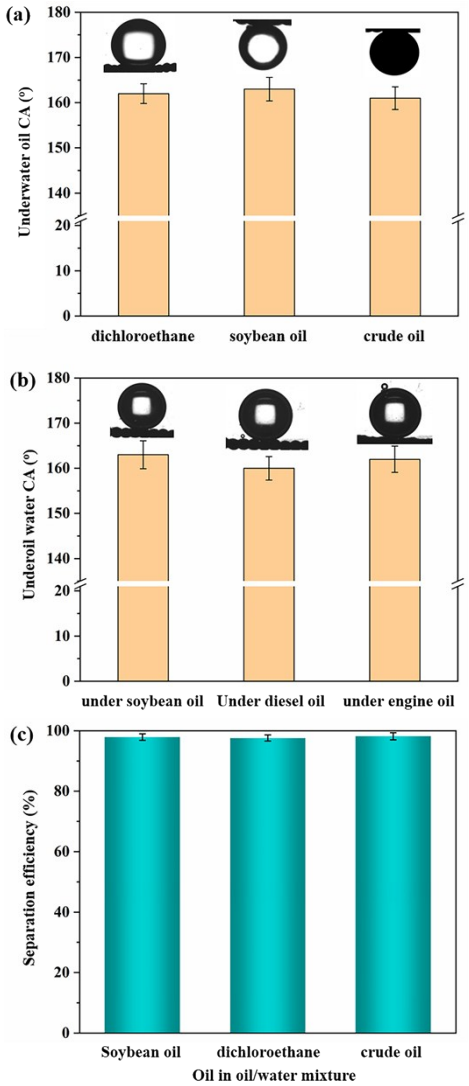

Fig.S4 (a)The underwater oil CAs and (b) underoil water CAs of the Iron mesh-MNS. (c) The oil/water separation efficiency of the Iron mesh-MNS toward different oil/water mixture.