Supporting Information for *Environmental Science: Nano*

Underwater Superoleophilic PVA-GO Nanofibrous Membranes for Emulsified Oily Water Remediation

Abdul Ghaffar [1, 2, 3], Cheng Chen [1, 2], Xiaoying Zhu [1, 2] and Baoliang Chen* [1, 2]

1. Department of Environmental Science, Zhejiang University, Hangzhou, Zhejiang 310058, China.

2. Zhejiang Provincial Key Laboratory of Organic Pollution Process and Control, Hangzhou Zhejiang 310058, China.

3. Shenyang National Laboratory for Materials Science, Institute of Metal Research, Chinese Academy of Sciences, 72 Wenhua Road, Shenyang 110016, China.

*Corresponding authors email:

Dr. Chen Baoliang blchen@zju.edu.cn

Tel: +86 – 571 – 8898 – 2587

Fax: +86 – 571 – 8898 – 2587

Coauthor emails:

Dr. Abdul Ghaffar: aghaffar@zju.edu.cn, abdulghaffar_30@yahoo.com

Cheng Chen: 840627088@qq.com

Dr. Xiaoying Zhu: zhux@zju.edu.cn

Synthesis of graphene oxide (GO)

GO was synthesized from natural Graphite flake (325 mesh, 99.8%, Alfa Aesar) by modified Hummers method. Generally, the graphite powder (10 g) was added into concentrated H_2SO_4 (40 mL) at 80 ºC, containing $K_2S_2O_8$ (8.33 g) and P_2O_5 (8.33 g), for 4.5 h. After that, the mixture was collected and rinsed with deionized water until the pH became neutral, dried in oven overnight at 60 ºC, thus pre-oxidized graphite obtained. The pre-oxidized graphite powder (10 g) and $NaNO_3$ (5 g) were put into an ice bath (0 ºC) concentrated H_2SO_4 (230 mL), and $KMnO_4$ (30 g) was slowly added with continuous stirring to keep the temperature below 4 ºC. Then the mixture was stirred at 35 ºC for 2 h, after which deionized water (460 mL) was gradually added, producing much heat. The mixture was further stirred for 15 min at 98 ºC to increase the oxidation level, following an addition of deionized water (460 mL) and 30% H_2O_2 solution (25 mL) to terminate the reaction, so as to obtain graphite oxide. The resultant bright yellow mixture was rinsed by 10% HCl solution (3.6 L) to remove the residual SO_4^{-} (checked by 0.01 mol L^{-1} $BaCl_2$) and metal ions, followed by centrifugation at 8000 rpm. The solid phase was re-dispersed in deionized water and peeled off by ultra-sonication for 30 min at 250 W of power. The centrifugation and ultra-sonication was repeated 3 times, and the solution was subjected to dialysis to remove the acid and other impurities. Finally, GO was obtained as powder after vacuum drying at 60 ºC.

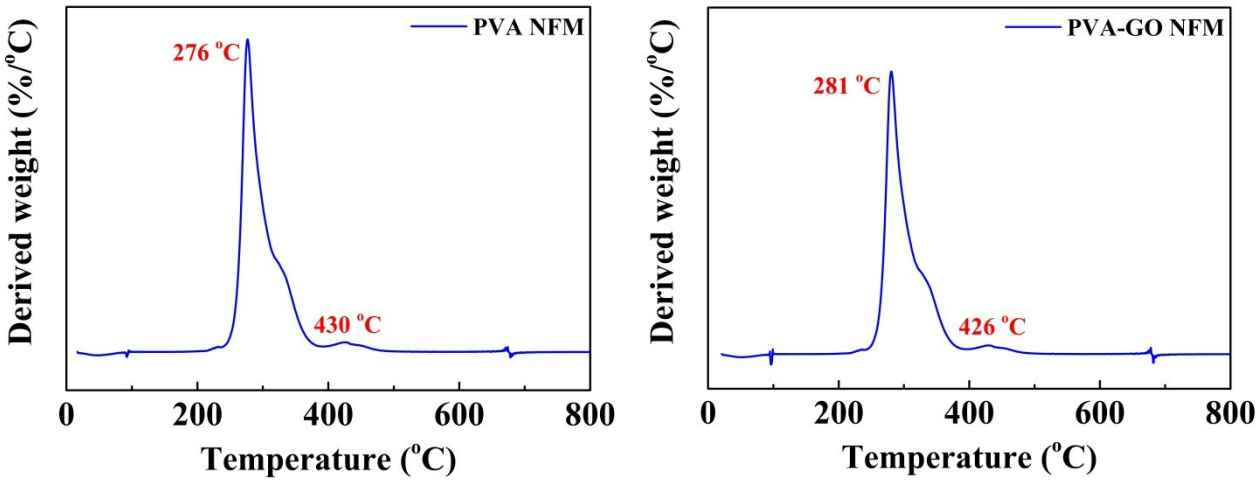

Figure S1. Derived thermogravimetric (DTG) curves of PVA and PVA-GO NFMs.

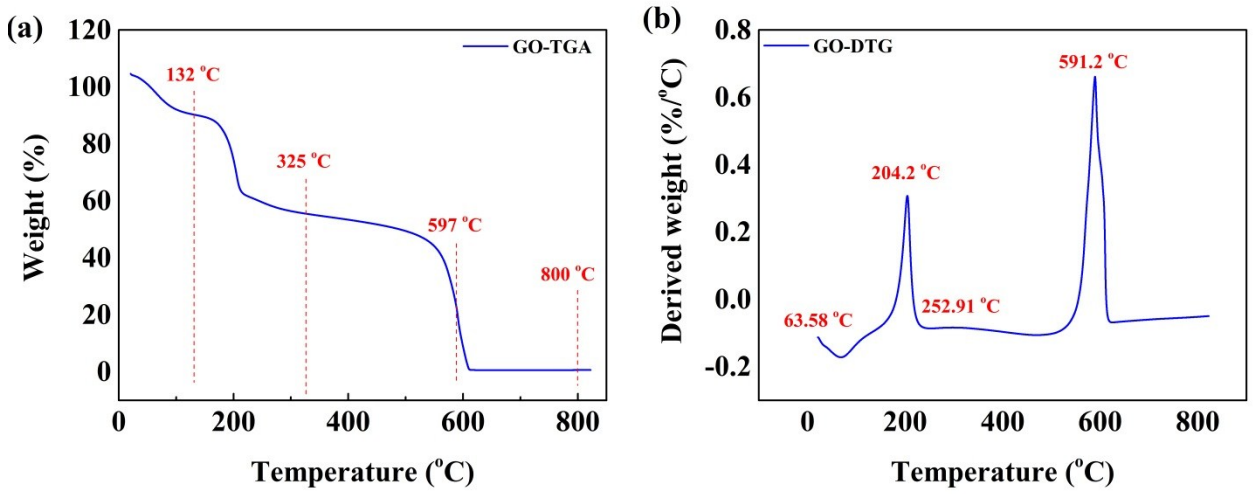

Figure S2. Thermogravimetric (a) and derived thermogravimetric (b) curves of GO.

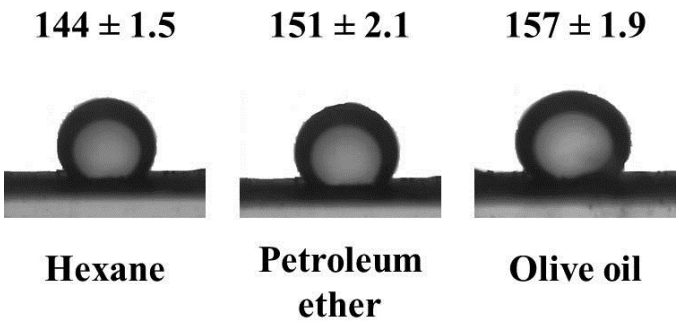

Figure S3. Under water oil contact angles of hexane, petroleum ether, and olive oil on the surface of PVA-GO NFM.

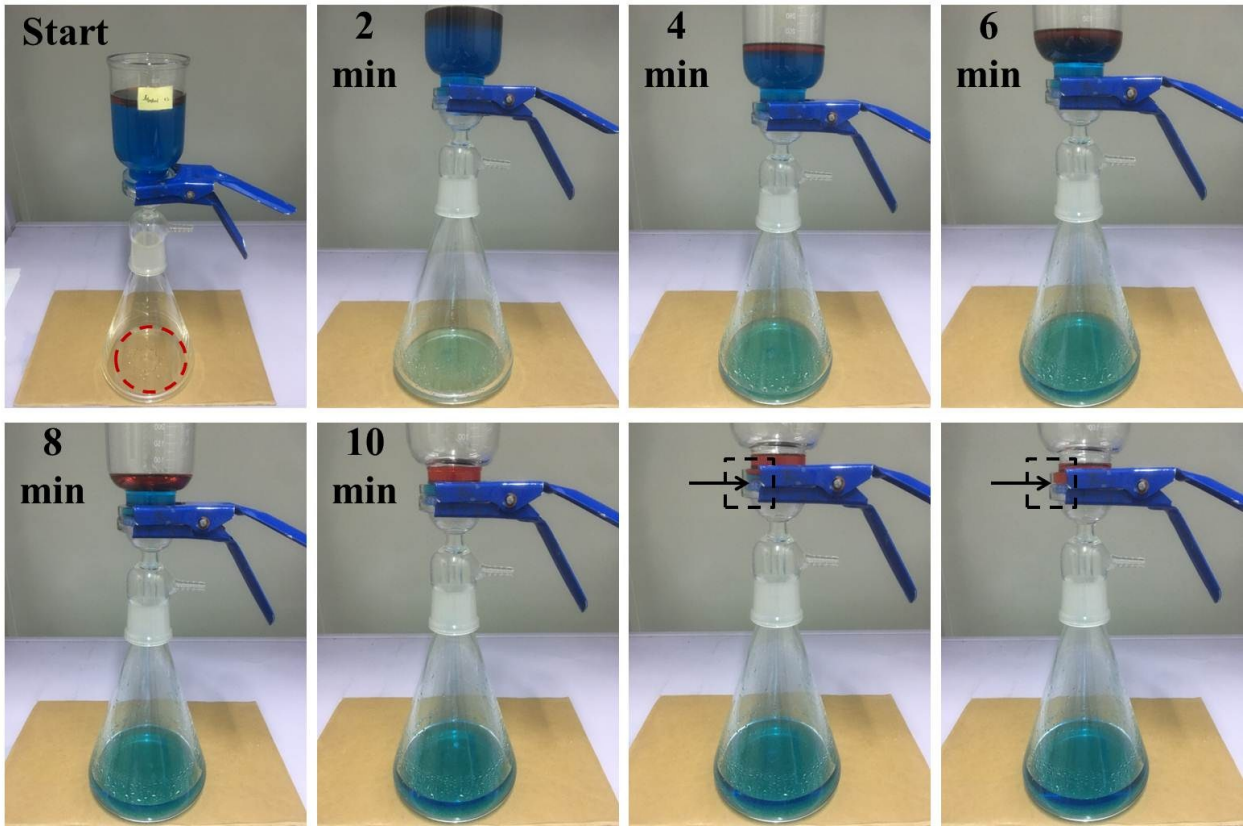

Figure S4. The optical photographs of oily water remediation and anti-oil property with PVA-GO NFM.