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Supplementary material

Facilely preparation photo-response TiO₂@copper wire mesh with quick on/off switchable superwetting for high efficiency oil-water separation

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Figure S1. Local enlarged SEM image of the original copper wire mesh.



Figure S2. SEM images of CWM after STA modification



Figure S3. WCA and underwater OCA of TiO₂@CWM under different modification conditions



Figure S4. The underwater OCA of different oils was also tested.



Figure S5. EDS analysis of TiO₂@CWM after UV irradiated.



Figure S6. Pollution and self-cleaning process of $TiO_2@CWM$.



Figure S7. The separation capability of the $TiO_2@CWM$ (a) heavy oil-water mixture and (b) light oil-water mixture after self-cleaning process.



Figure S8. The WCA of U-TiO₂@CWM after 20 cycles of abrasion.



Figure S9. (a) Heavy oil - water separation efficiency and flux of S-TiO₂@CWM after abrasion test. (b) Light oil-water separation efficiency and flux of U-TiO₂@CWM after abrasion test.

Video S1. Dichloroethane-water separation process of the $TiO_2@CWM$: oil quickly permeated through the mesh, while water was blocked in the upper glass tube.

Video S2. Petroleum ether-water separation process of the $TiO_2@CWM$: water quickly permeated through the mesh, while oil was blocked in the upper glass tube.

Video S3. The friction properties of the prepared $TiO_2@CWM$ were measured by sandpaper and weight.

Video S4. The friction surface of the TiO_2 @CWM was the same as that of the non-friction surface, and the water drops can roll rapidly.