Electronic Supplementary Material (ESI) for RSC Advances.


**Electronic supplementary information for**

# A facile approach to transform stainless steel mesh into smart pH-responsive material

Fuchao Yang[ac] and Zhiguang Guo [*ab]

[a] State Key Laboratory of Solid Lubrication, Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences, Lanzhou 730000, People's Republic of China

[b] Hubei Collaborative Innovation Centre for Advanced Organic Chemical Materials and Ministry of Education Key Laboratory for the Green Preparation and Application of Functional Materials, Hubei University, Wuhan 430062, People's Republic of China

[c] Graduate School of Chinese Academy of Sciences, Beijing 100049, People's Republic of China

* The corresponding author: Tel: 0086-931-4968105; Fax: 0086-931-8277088; Email: zguo@licp.cas.cn.

**Supplementary Figures**

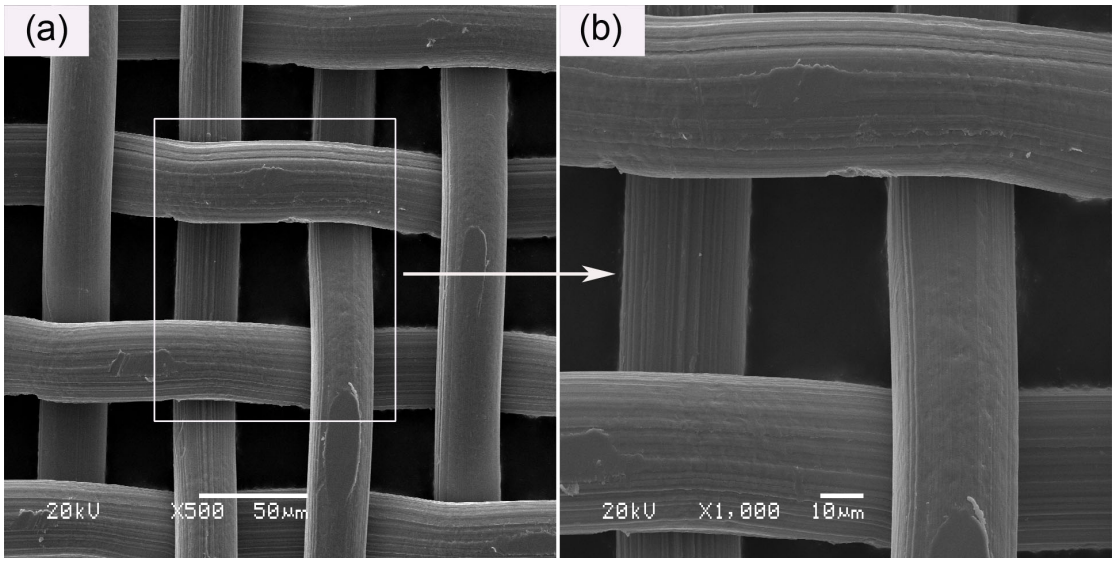


FIG. S1. Typical SEM images of pristine stainless steel mesh.

FIG. S2. EDS of pristine stainless steel mesh.

**Table S1** Elements contents of pristine stainless steel mesh detected by EDS.

| Elements | Type of line | apparent concentration | The ratio of k | at% | wt% | wt% Sigma |
|---|---|---|---|---|---|---|
| C | K level | 3.45 | 0.03451 | 38.50 | 12.82 | 0.48 |
| O | K level | 2.36 | 0.00793 | 3.74 | 1.66 | 0.19 |
| F | K level | 3.29 | 0.00646 | 3.38 | 1.78 | 0.35 |
| Si | K level | 0.33 | 0.00259 | 0.50 | 0.39 | 0.05 |
| Cr | K level | 23.45 | 0.23447 | 11.39 | 16.41 | 0.19 |
| Fe | K level | 70.30 | 0.70299 | 36.26 | 56.14 | 0.45 |
| Ni | K level | 10.55 | 0.10550 | 5.58 | 9.09 | 0.20 |
| Mo | L level | 1.70 | 0.01696 | 0.65 | 1.72 | 0.16 |
| Ag | L level | 0.00 | 0.00000 | 0.00 | 0.00 | 0.00 |
| Total | | | | 100.00 | 100.00 | |

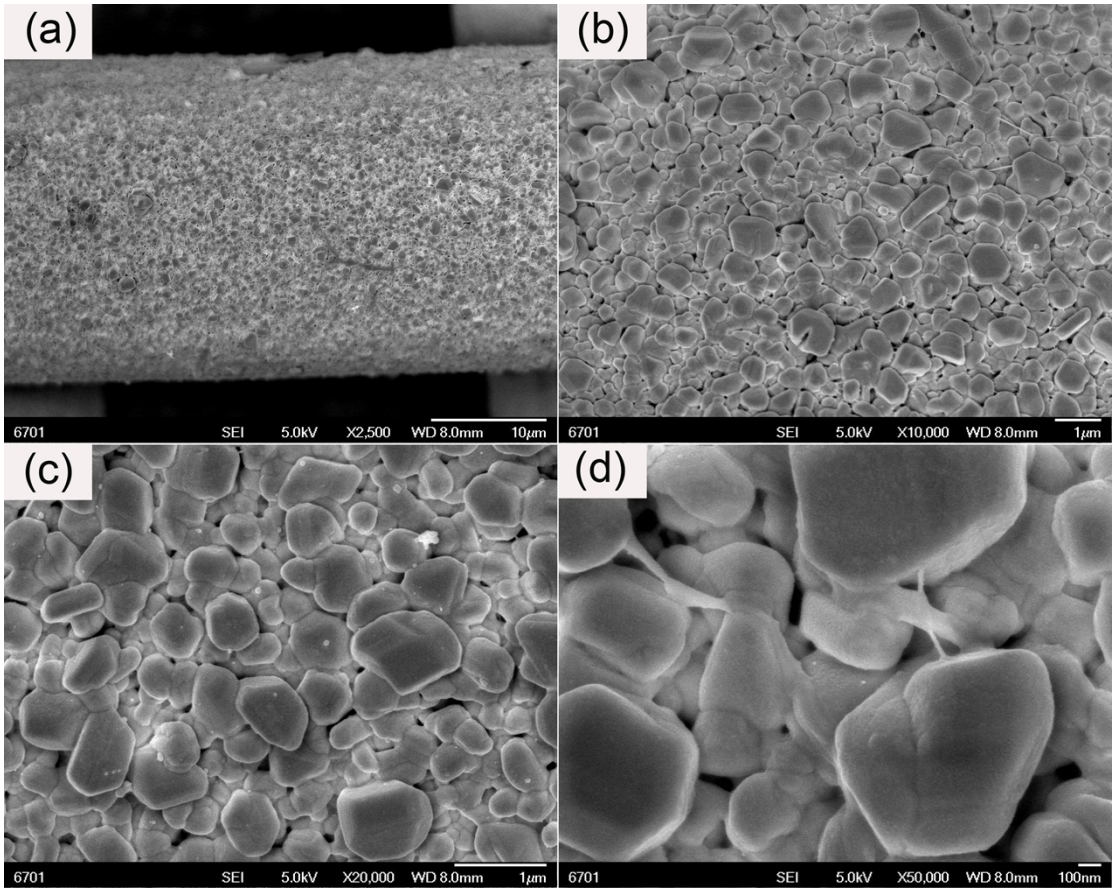


FIG. S3. Different magnifications of FESEM images of Ag-coated SSM after mixed thiol modification.

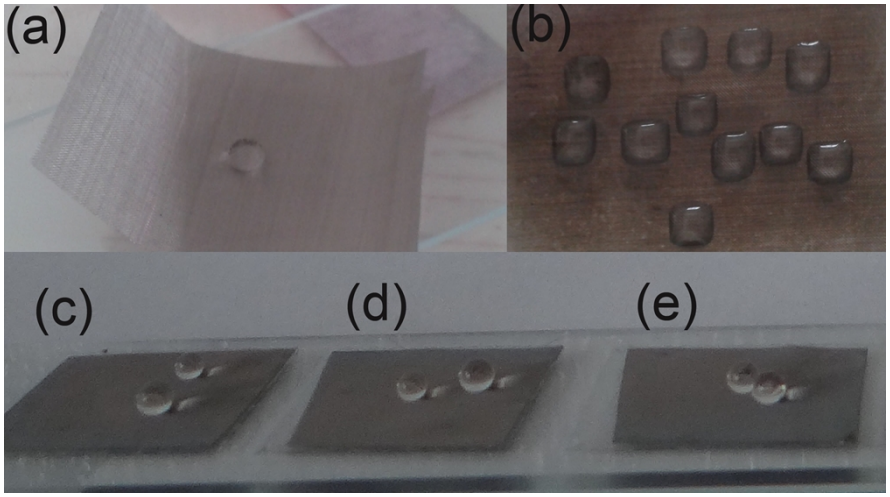


FIG. S4. Photographs of (a) water drop on original SSM, (b) water drop on SSM modified by PDA. Photographs of acidic droplet (c), neutral droplet (d) and basic droplet on SSM modified by n-octadecyl thiol.

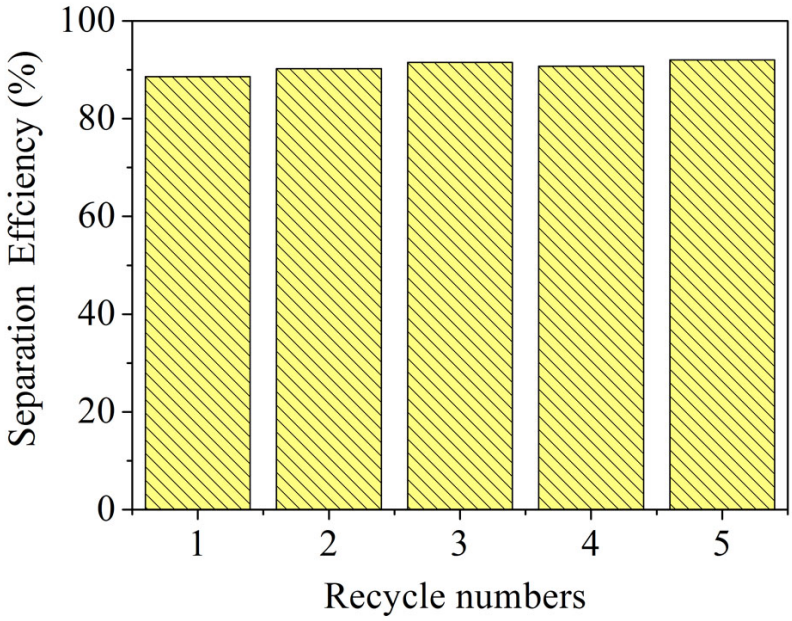


FIG. S5. the separation efficiency of the smart meshes in oil/water separation experiments under multiple recycles