Supporting Information

Stable Underwater Superoleophobic and Low Adhesive

Polypyrrole Nanowire Mesh in Highly Corrosive Environments

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Fig. S1 $(CH_2)_2Cl_2$ droplet on the pristine stainless steel mesh underwater. b) $(CH_2)_2Cl_2$ CA on the flat PPy-coated steel mesh, c) $(CH_2)_2Cl_2$ droplet on the flat PPy-coated steel mesh with tilt angle of 30° underwater, indicating the high adhesive property.



Fig. S2 Oil CA in air on the surface of the flat PPy-coated steel mesh.



Fig. S3 Water CA in air on the surface of the flat PPy-coated steel mesh.



Fig.S4 Oil CA in air on the surface of the smooth PPy-coated steel sheet.



Fig. S5 SEM image of PPy nanowire mesh. The two circular selected in SEM image were used as representative areas for determining the area fraction of solid. The diameter of two circles is 1560 nm, and an average diameter of PPy nanowire is 110 nm. The number of PPy nanowire are N_1 =68 and N_2 =61. The area fraction of solid is calculated using following equation:¹

$$A = \frac{\pi(\frac{D_2^2}{2})}{\pi(\frac{D_1^2}{2})} \times N_t$$
(1)

where A is the area fraction of PPy nanowire mesh, D_1 is the diameter of two circle, D_2 is an average diameter of PPy nanowire, $N_t(t = 1, 2)$ is the number of PPy nanowire in the circle. According to Equation 1, A average value can be calculated to be 0.32.



Fig. S6 The optical photographs of meshes immersed in different corrosive aqueous solutions, including NaCl (1 mol·L⁻¹), HCl (1 mol·L⁻¹) and NaOH (1 mol·L⁻¹), respectively. Pristine stainless steel mesh (left) and PPy nanowire mesh (right) in every jar.



Fig. S7The optical photographs of pristine stainless steel mesh (left) and PPy nanowire mesh (right) after immersing them in HCl (1 mol· L^{-1}) for one day.

Reference

(1) F.Zhang, W. B.Zhang, Z.Shi, D.Wang, J.Jin, L.Jiang, Adv Mater 2013, 25, 4192.