

Electronic Supplementary Material

Extremely low friction on gold surface with surfactant molecules induced by surface potential

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1 Diagram of the experimental working electrode preparation

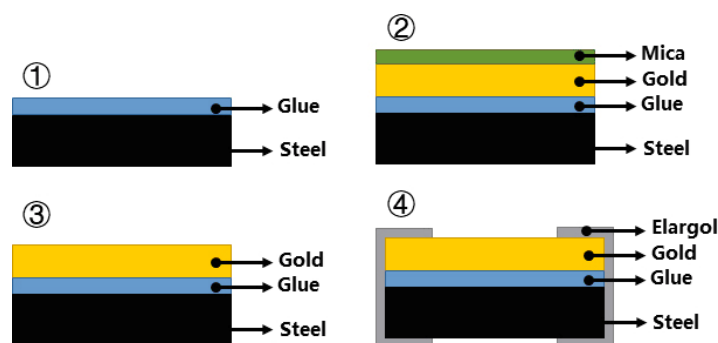


Fig. S1 Flow diagram of the molecularly smooth gold surface manufacture.

2 Corresponding cyclic voltammetry curve of this system

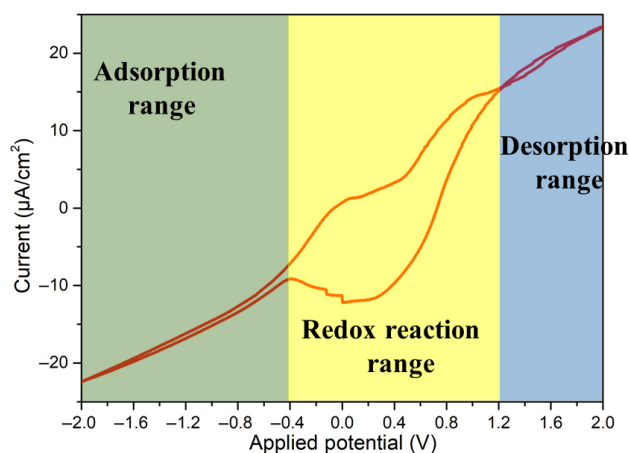


Fig. S2 Corresponding cyclic voltammetry (CV) curve of this system. The potential range from -2 to -0.4 V was the adsorption range of the C_{16}TAB molecules. The potential range from -0.4 to 1.2 V was the redox reaction range of the C_{16}TAB molecules. The potential range from 1.2 to 2 V was the desorption range of the C_{16}TAB molecules.

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3 Comparison of the lubrication state obtained on the gold surface with and without applied potential

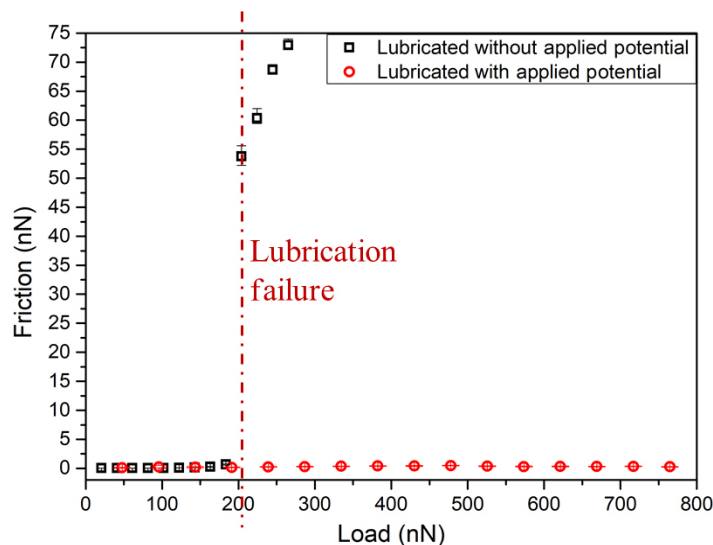


Fig. S3 Comparison of the lubrication state obtained on the gold surface with and without applied potential. With normal load increasing, the lubrication failure occurred on the surface without applied potential, but it did not occur with applied potential (-0.8 V).

4 XPS measurements on the gold surfaces

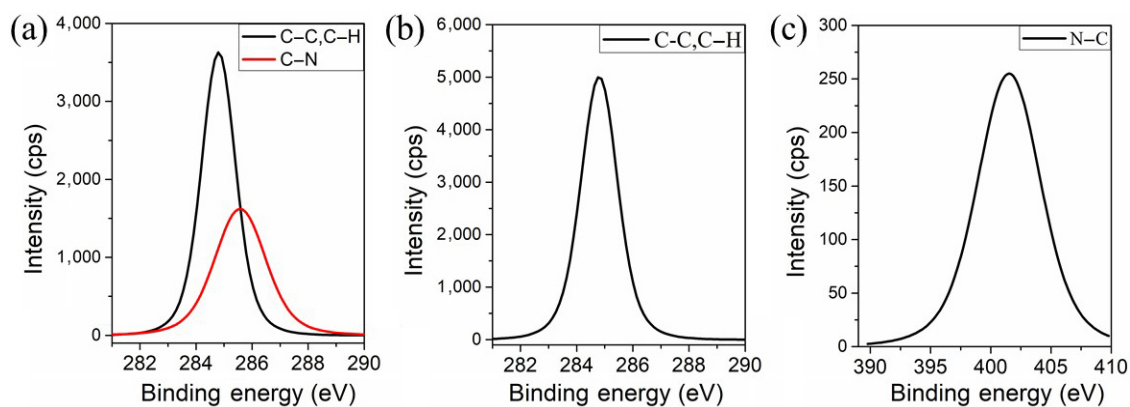


Fig. S4 X-ray photoelectron spectroscopy (XPS) measurements on the gold surfaces. (a) Spectrum of C 1s on the gold surface after the negative potential (-0.8 V) was applied. (b) Spectrum of C 1s on the gold surface with no potential applied. (c) Spectrum of N 1s on the gold surface after the negative potential (-0.8 V) was applied.