Electronic Supplementary Material (ESI) for Nanoscale.

Supplementary Information

Large area metal micro/nano-groove arrays with both structural color and anisotropic wetting fabricated by one-step focused laser interference lithography

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Changes in surface chemistry after laser ablation

Figure S1(a) shows X-ray photoelectron spectroscopy (XPS) wide survey spectra of 316L stainless steel surface before and after laser ablation. The detected elements were the main elements of 316L stainless steel as expected. As exhibited in Figure S1(b), O 1s spectra of 316L stainless steel surface before and after laser ablation were deconvoluted into three peaks locating at three binding energy by Gaussian fitting analysis.[26,27] The first peak (530.5 ± 0.5 eV) should be assigned to O^{2-} ions in the metal oxide bond. The second one (531.2 ± 0.2 eV) is derived from surface hydroxyl groups and oxygen vacancies. The third one (532.4 ± 0.1 eV) is ascribed to the oxygen bonds with carbon (C-O, C=O) and H_2O. By comparing the ratios of the three peaks to the total intensity before and after laser ablation, it is noteworthy that the ratio of the third peak increased whereas the ratio of the second peak decreased, which indicated that surface hydroxyl groups and oxygen vacancies decreased and oxygen bonds with carbon (C-O, C=O) and H_2O increased. The decrease of hydroxyl groups leaded to the increase in hydrophobicity.

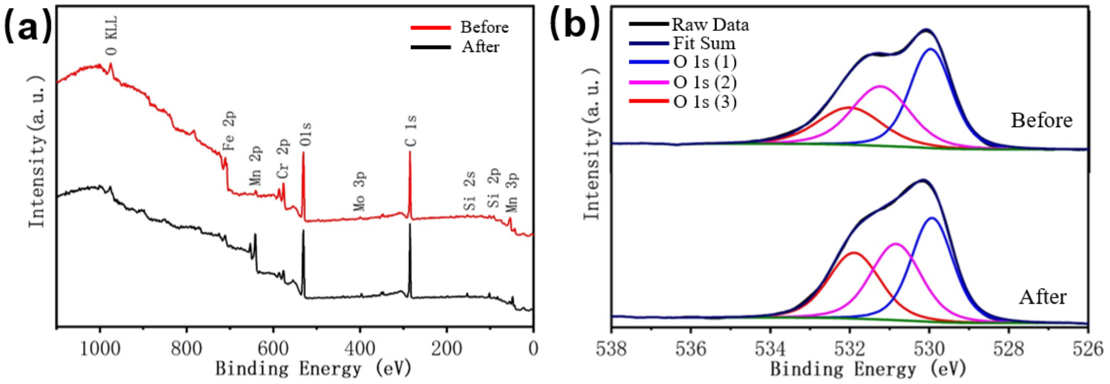

Figure S1. (a) XPS wide survey spectra for 316L stainless steel surface before and after laser ablation. (b) Comparison of XPS spectrums for O 1s on 316L stainless steel surface before and after laser ablation.