

Supporting Information for:

A New Route for Surface Modification: Fluorine-Induced Superhydrophilicity

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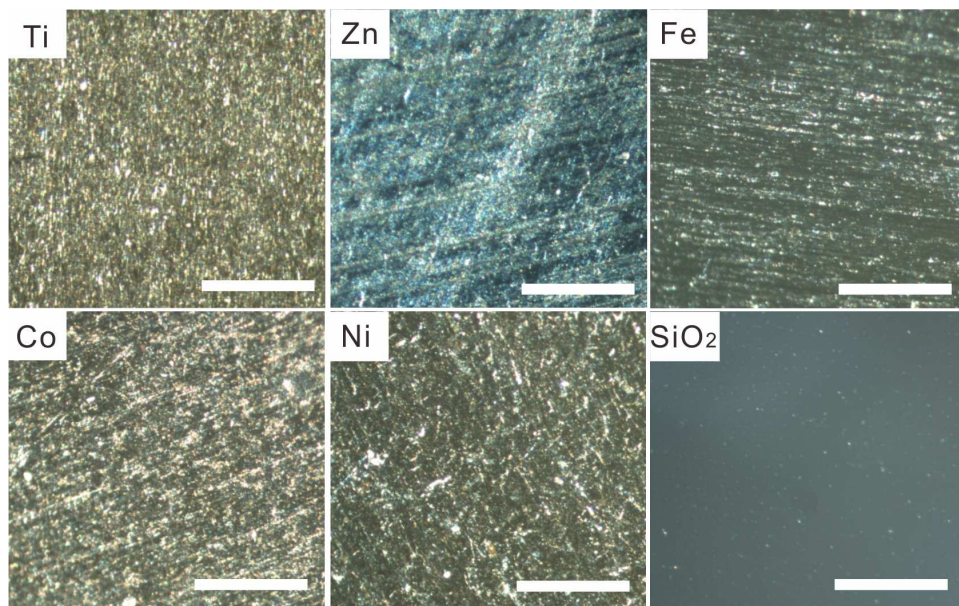


Figure S1 The micrographs of Ti, Zn, Fe, Co, Ni and glass (SiO_2) before oxy-fluoridation, respectively. The bar is 200 μm .

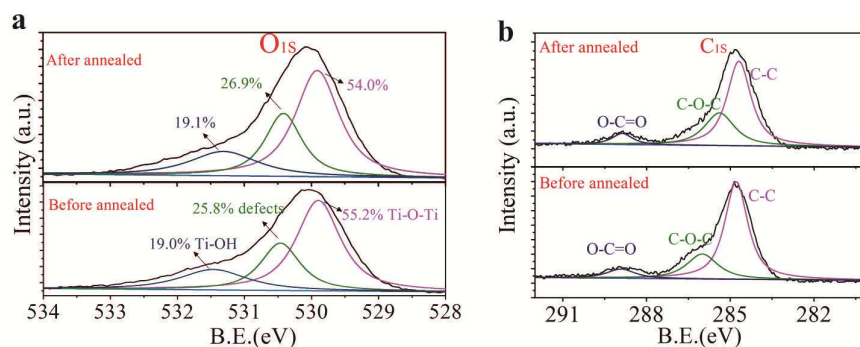


Figure S2 The XPS analysis of O and C of TiO₂ island arrays (TiIAs). (a) the XPS analysis of O element. The O element represents for three components, the surface hydroxyl species (H₂O and Ti-OH) which will affect the wettability of TiIAs are almost unchanged after annealed. (b) the XPS analysis of C element. The C element also represents for three components, their contents are almost remain the same after annealed.

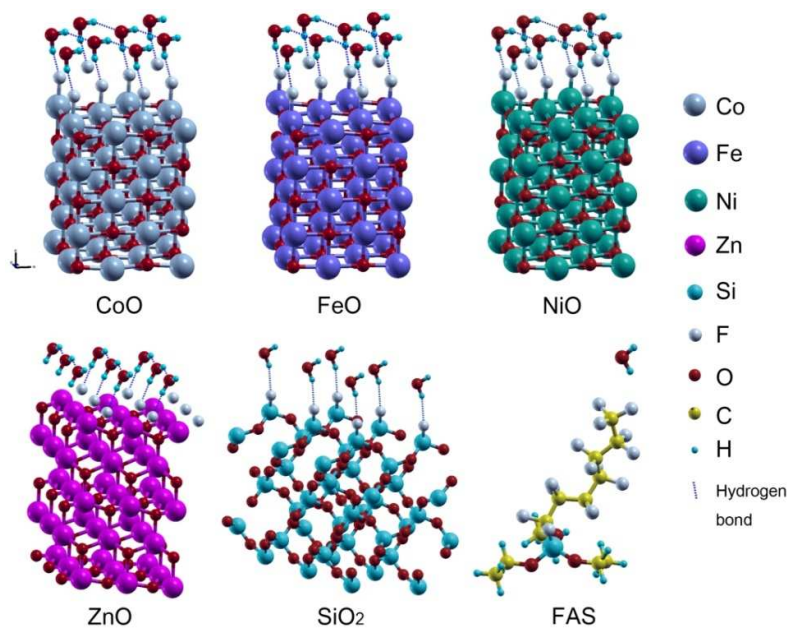


Figure S3 Computational models of interaction forces between oxy-fluoridized interfaces and water molecules.

Table S1. Details of computational data of bond energies.

| Surface | Bond Energy kJ·mol⁻¹ | Surface | Bond Energy kJ·mol⁻¹ |
|----------------------------|--|----------------|--|
| TiO ₂ -F | 26.16 | ZnO-F | 27.23 |
| TiO ₂ -OH | 17.88 | NiO-F | 19.24 |
| SiO ₂ _quartz-F | 7.232 | CoO-F | 19.14 |
| FAS molecular | 5.469 | FeO-F | 16.48 |

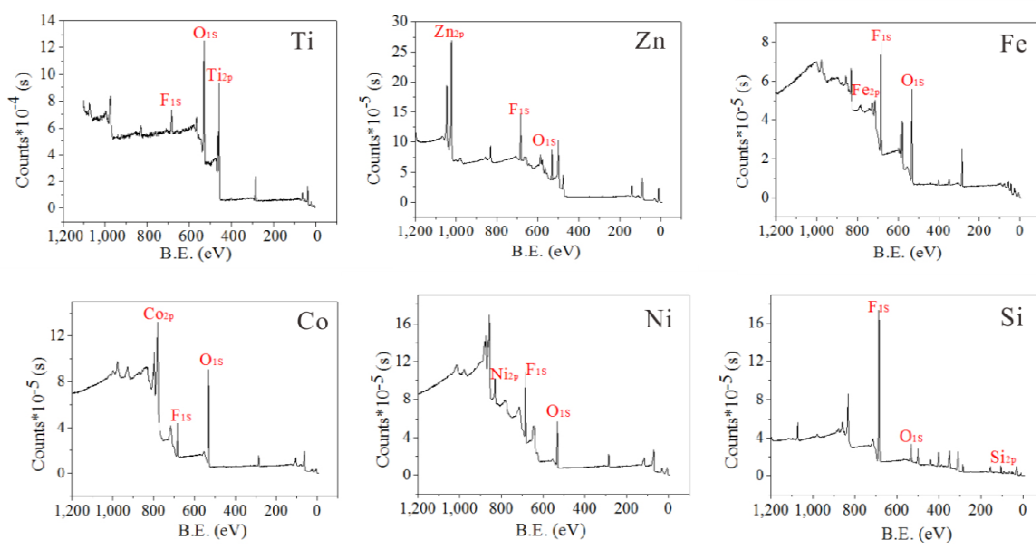


Figure S4 X-ray photoelectron spectrums of oxy-fluoridized interfaces. Each interface mainly consists of O, F and element itself.

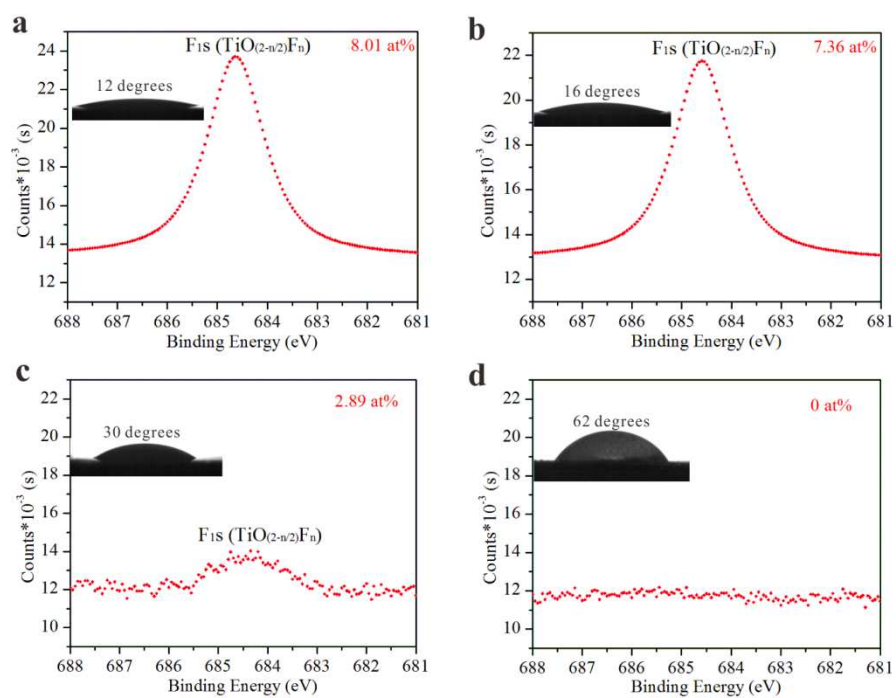


Figure S5 The stability of fluorine-induced superhydrophobicity (FIS) under annealing. (a) as-prepared specimen and annealed under (b) 100 °C; (c) 200 °C; (d) 300 °C for 2 h. The FIS can bear about 100 °C temperature, the wettability of specimens is degenerated as the content of oxy-fluorides decreased.