

## Supporting Information

# Highly selective, sensitive, and visible detection of fluoride ions through transforming their roles from reactants to catalysts in silicon corrosion reaction

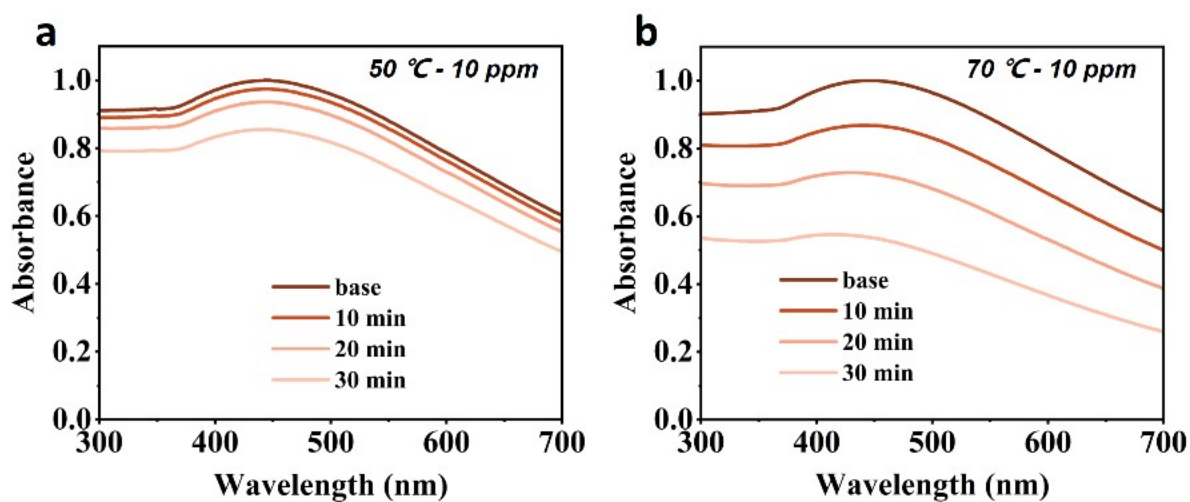
*Xinyue Hu,<sup>a</sup> Bingchang Zhang,<sup>\*b</sup> Yihao Shi,<sup>a</sup> Xingda An,<sup>\*a</sup> Jia Yu,<sup>a</sup> Le He,<sup>a</sup> and Xiaohong Zhang,<sup>\*a,c</sup>*

<sup>a</sup> Institute of Functional Nano and Soft Materials (FUNSOM), Jiangsu Key Laboratory for Carbon-Based Functional Materials and Devices, Soochow University, Suzhou 215123, Jiangsu, P. R. China.

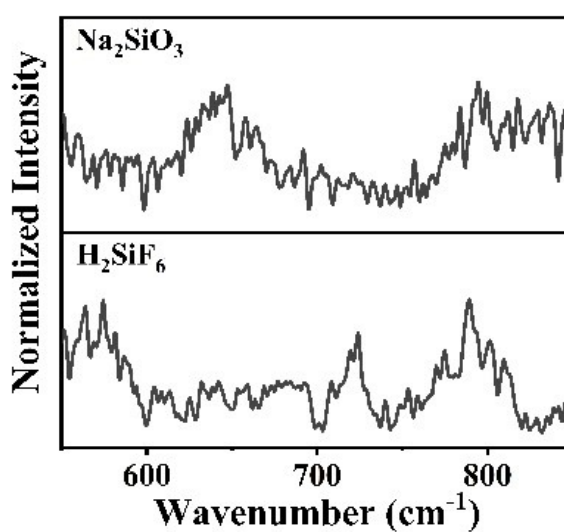
<sup>b</sup> School of Optoelectronic Science and Engineering, Key Laboratory of Advanced Optical Manufacturing Technologies of Jiangsu Province, Key Laboratory of Modern Optical Technologies of Education Ministry of China, Soochow University, Suzhou 215006, P. R. China.

<sup>c</sup> Jiangsu Key Laboratory of Advanced Negative Carbon Technologies, Soochow University, Suzhou, 215123, P. R. China.

E-mail: zhangbingchang@suda.edu.cn; xdan@suda.edu.cn; xiaohong\_zhang@suda.edu.cn;



**Figure S1.** Fluorine detection performance of SiNP suspension at different temperatures. a) Time-dependent absorption spectra of SiNP suspension after adding 10 ppm fluoride ions at 50°C. b) Time-dependent absorption spectra of SiNP suspension after adding 10 ppm fluoride ions at 70°C.



**Figure S2.** Raman spectra of sodium silicate and fluorosilicic acid