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Supporting Information

Sorption of Differently Charged Gold Nanoparticles on Synthetic Pyrite

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1. Characterization of Pyrite

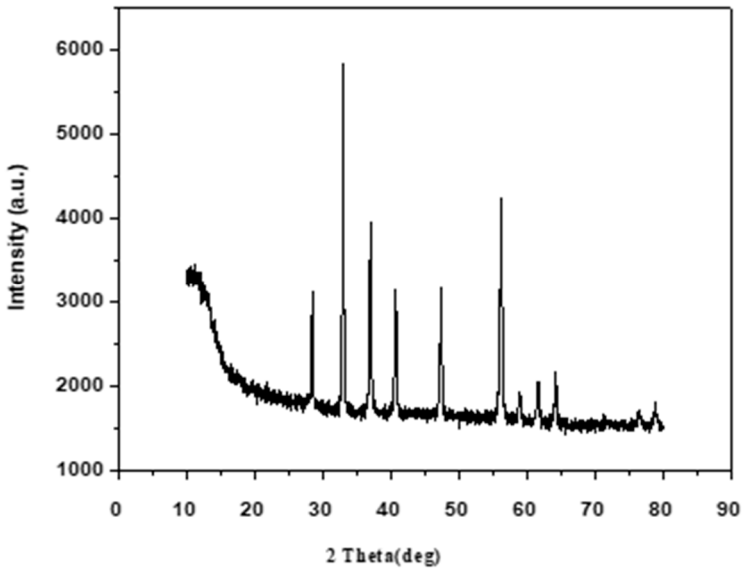

Figure S1. XRD of pyrite.

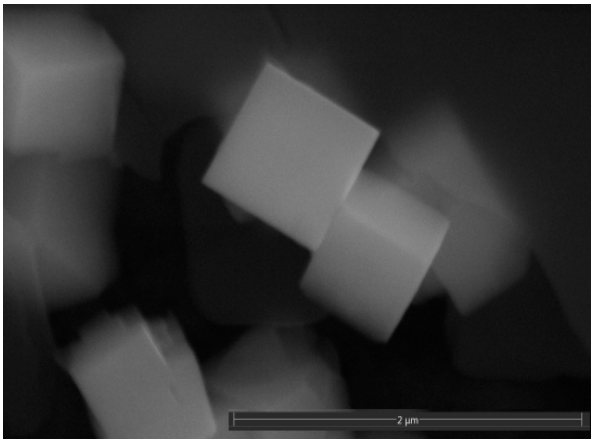

Figure S2. SEM micrographs of synthesized pyrite.

2. Effect of Ageing on Positively Charged AuNPs' Stability

The stability of positively charged AuNPs was verified by ageing the nanoparticles for 180 days while measuring UV-Vis spectra at different time intervals (e.g., Figure S3). The negligible change in the shape or wavelength of the UV-Vis absorption peak indicated good stability.

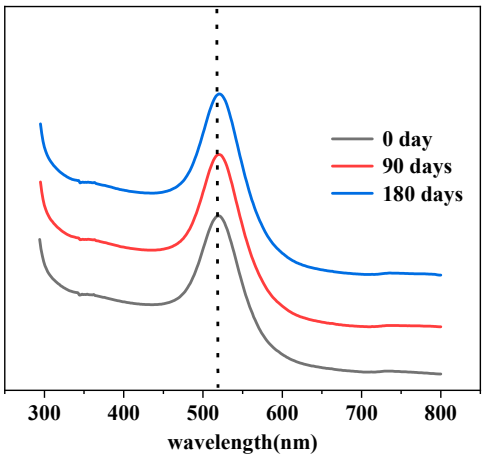

Figure S3. Effect of ageing on the stability of positively charged AuNPs.

3. XPS Spectrum of Pyrite after Sorption of Positively Charged AuNPs

Figure S4 represents the Au 4f 7/2, 5/2 doublet spectra from adsorbed pyrite. A component at a binding energy approaching 84.0 eV can be assigned to AuNPs.

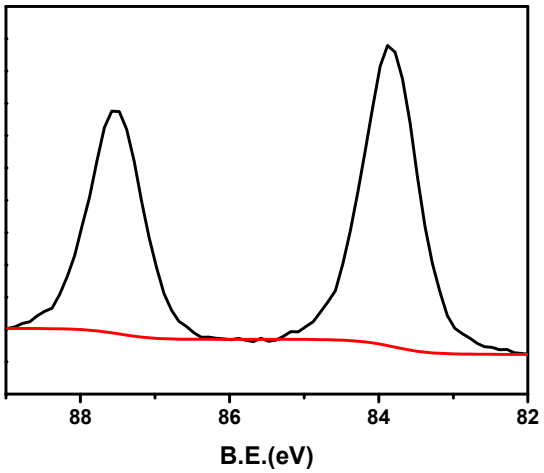

Figure S4. Au 4f XPS spectrum of pyrite after sorption of positively charged AuNPs.

4. Zeta Potential of Pyrite and Positively Charged AuNPs at Different NaCl Concentrations

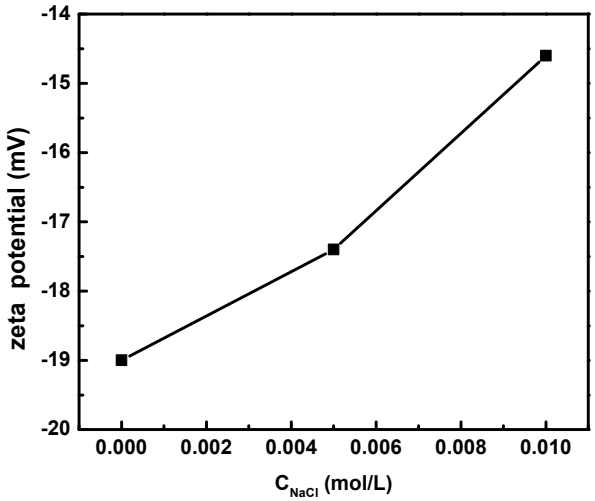

Figure S5. zeta potential of pyrite at different NaCl concentrations (pH = 4).

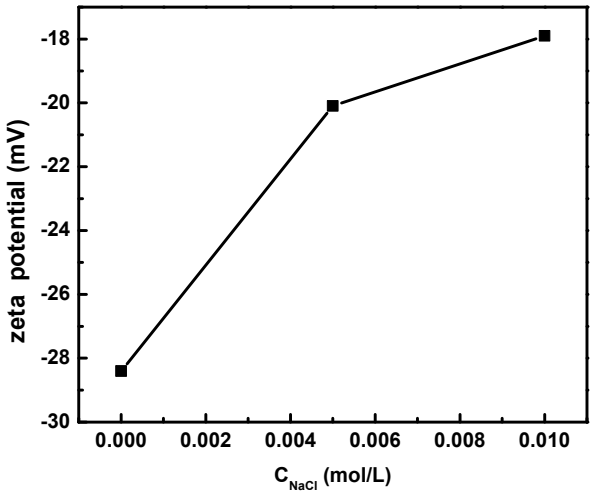

Figure S6. zeta potential of pyrite at different NaCl concentrations (pH = 7).

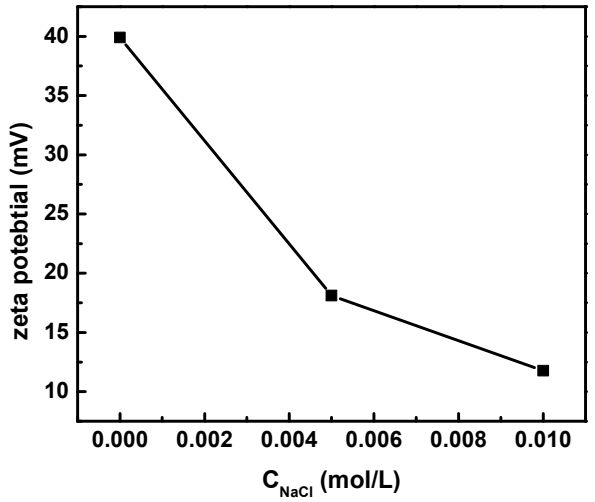

Figure S7. zeta potential of positively charged Au NPs at different NaCl concentrations (pH = 4).

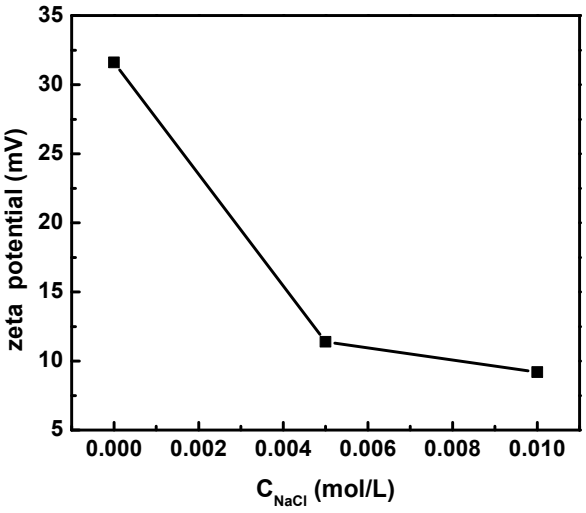

Figure S8. zeta potential of positively charged Au NPs at different NaCl concentrations (pH = 7).

Figures S5 and S6 plotted the zeta potentials of pyrite at different NaCl concentrations at pH 4 and 7, respectively. Figures S7 and S8 plotted the zeta potentials of positively charged AuNPs at different NaCl concentrations at pH 4 and 7, respectively. The results showed that the absolute values of the zeta potential for both pyrite and positively charged AuNPs decreased with the increase of ionic strength.