Electronic Supplementary Information

Rapid and sensitive colorimetric sensor for hypochlorite detection based on polyvinylpyrrolidone-stabilized gold nanoparticles

Yingjie Ye,[a] Qian zhang,[a] Yongxing Zhang*[b], Yue Li,[a]   Fengxian Gao,[a]   Dong Ma,[b]   Shun Lu*[c]

[a] School of Materials and Chemical Engineering, Henan University of Engineering, Zhengzhou, Henan 451191, China

[b] Anhui Province Key Laboratory of Pollutant Sensitive Materials and Environmental Remediation, Department of Materials Science & Engineering, Huaibei Normal University, Huaibei 235000, China

[c] Chongqing Institute of Green and Intelligent Technology, Chinese Academy of Sciences, Chongqing 400714, China

*Corresponding authors: zyx07157@mail.ustc.edu.cn (Y. Zhang); lushun@cigit.ac.cn (S. Lu)
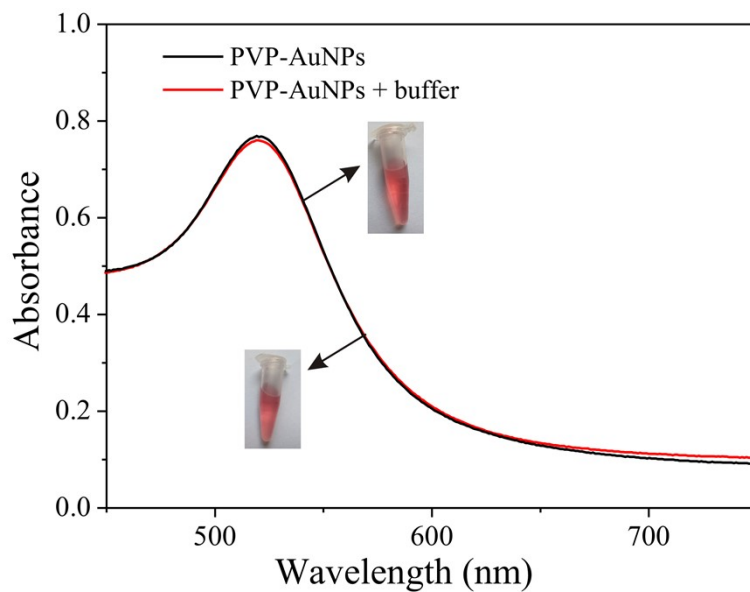
Figure S1. UV-vis spectra of 800 μL PVP-AuNPs + 200 μL H$_2$O and 800 μL PVP-AuNPs with the addition of 200 μL mixtures of buffer (50 mM; pH 4.5).
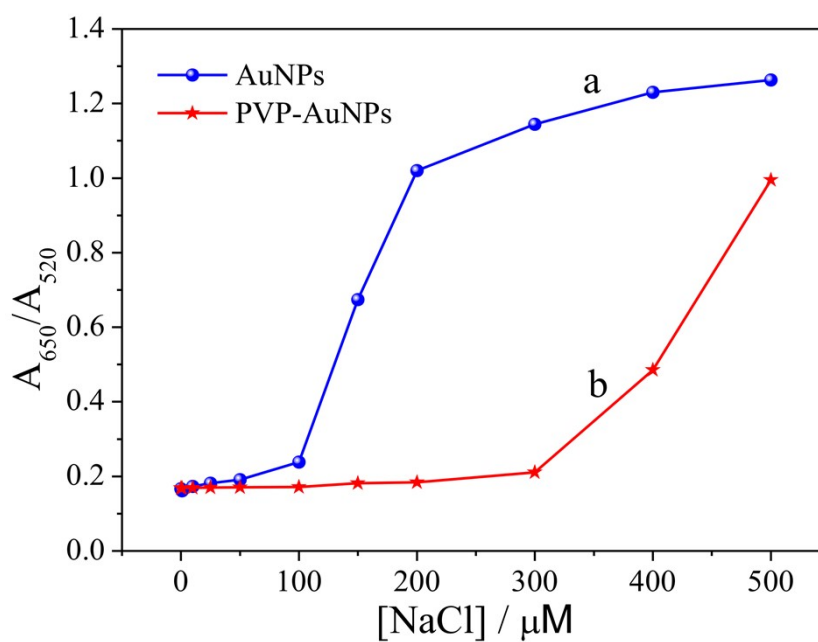

Figure S2. (a) Absorbance ratio of AuNPs (800 μL) after adding different concentrations of NaCl (200 μL). (b) Absorbance ratio of PVP-AuNPs with various amounts of NaCl. Conditions: 800 μL PVP-AuNPs + 200 μL NaCl. The amount of PVP contained in the PVP-AuNPs nanodispersion is 0.025%.
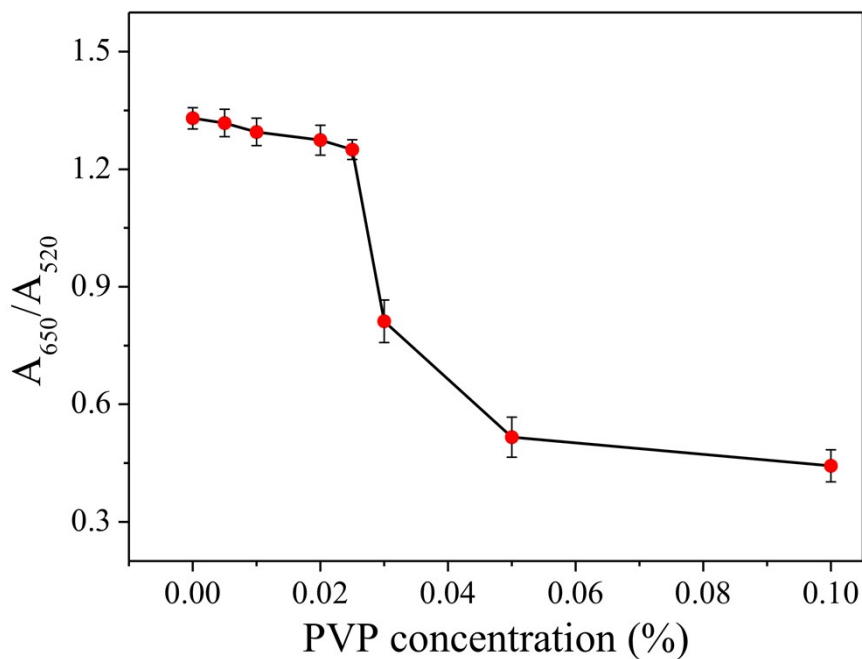
Figure S3. Effect of PVP concentration on the absorbance ratio of AuNPs (800 μL) added with 200 μL of the mixtures of buffer (75 mM) and cysteine (20 μM). The concentrations of PVP in the AuNPs were 0, 0.005%, 0.01%, 0.02%, 0.025%, 0.03%, 0.05% and 0.1%, respectively. Error bars derived from a set of three experiments.
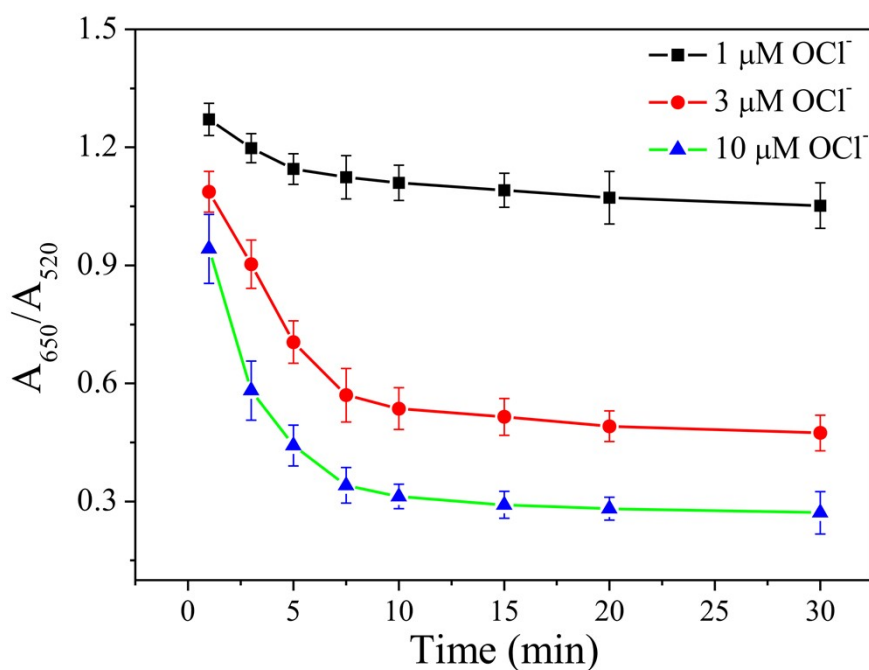

Figure S4. Absorbance ratios of PVP-AuNPs after the addition of cysteine (20 μM) and OCl⁻ (1 μM; 3 μM; 10 μM) mixture solutions in buffer at different reaction time.
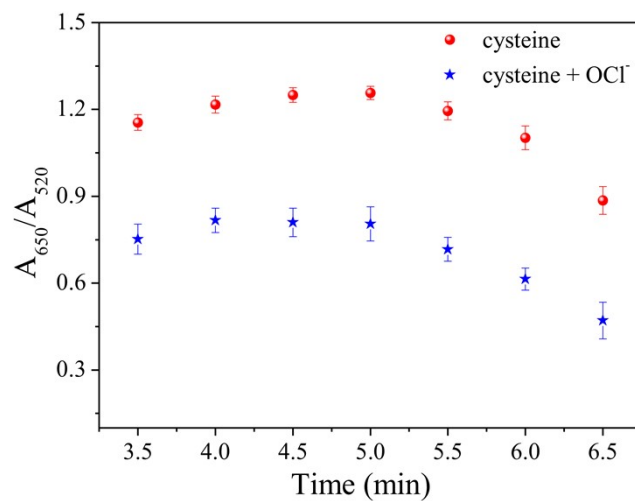
Figure S5. Effect of pH on the value of A_{650}/A_{520} of the PVP-AuNPs-based detection system in the absence and presence of 3 μM OCl⁻.
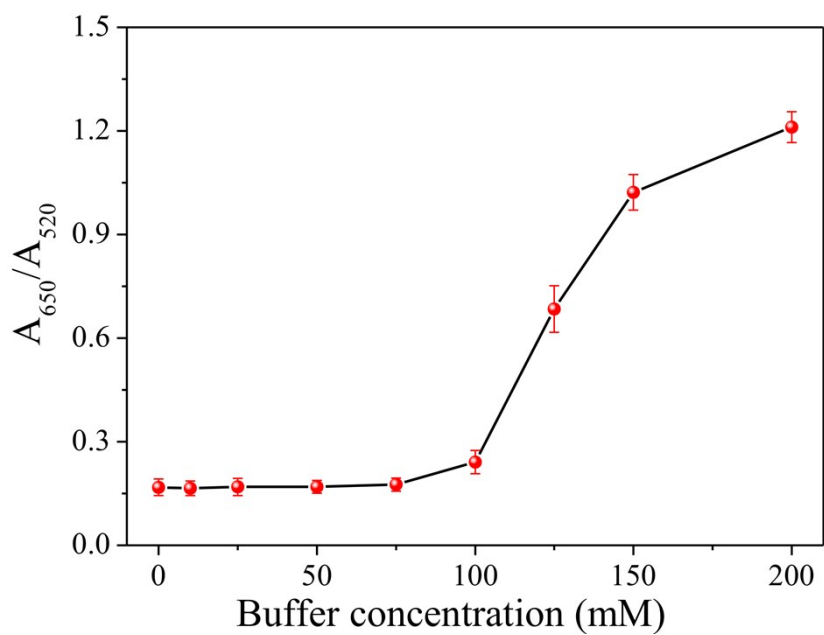

Figure S6. A_{650}/A_{520} values of the PVP-AuNPs solutions as a function of buffer concentration.