

Supporting Information

Core/shell Cu@Ag nanoparticle: A versatile platform for colorimetric visualization of inorganic anions

*Jia Zhang,^{1,2} Yue Yuan,¹ Xiaowen Xu,^{1,2} Xiaolei Wang,¹ and Xiurong Yang^{*1}*

¹State Key Laboratory of Electroanalytical Chemistry, Changchun Institute of Applied Chemistry,
Chinese Academy of Sciences, Changchun 130022, Jilin, China

²Graduate School of the Chinese Academy of Sciences, Beijing 100049, China

*E-mail: xryang@ciac.jl.cn; Fax: +86 431 85269278

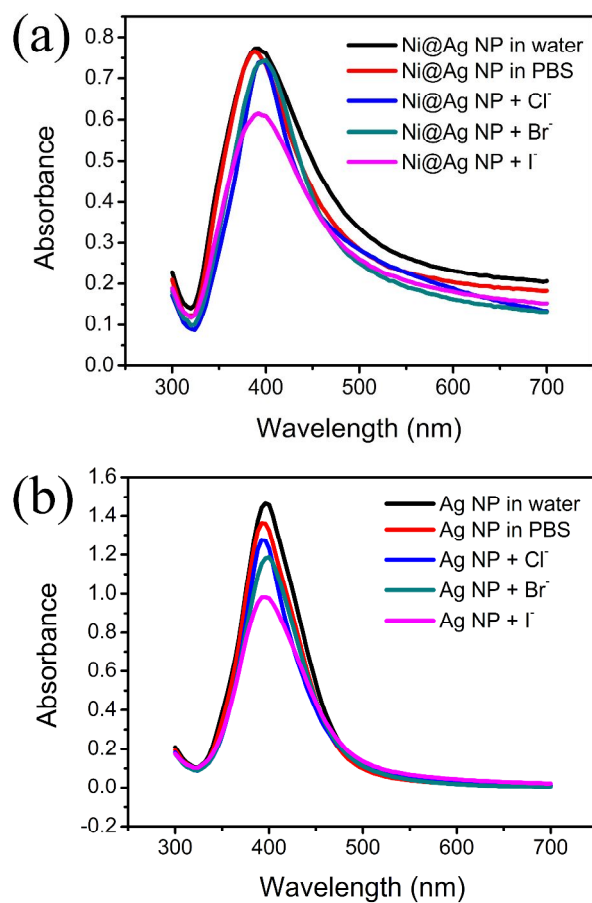


Figure S1. The optical spectra for (a) the Ni@Ag NP and (b) Ag NP solutions after interaction with anions. The concentrations of Cl⁻, Br⁻, and I⁻ are 1 mM, 10 μ M, and 10 μ M, respectively.

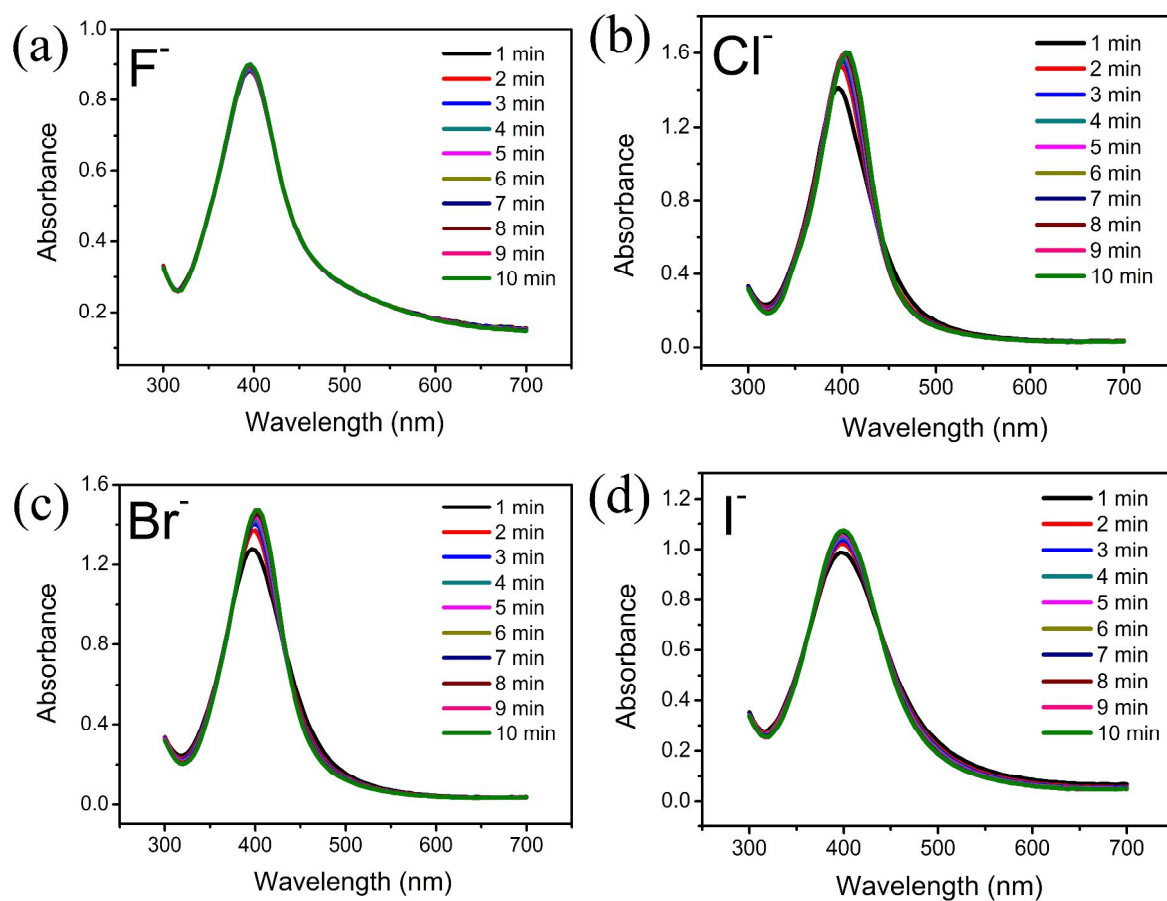


Figure S2. Time-dependent optical spectra for the Cu@Ag NP solution in the presence of (a) F^- (1 mM), (b) Cl^- (1 mM), (c) Br^- (10 μM), and (d) I^- (10 μM), pH 5.2.

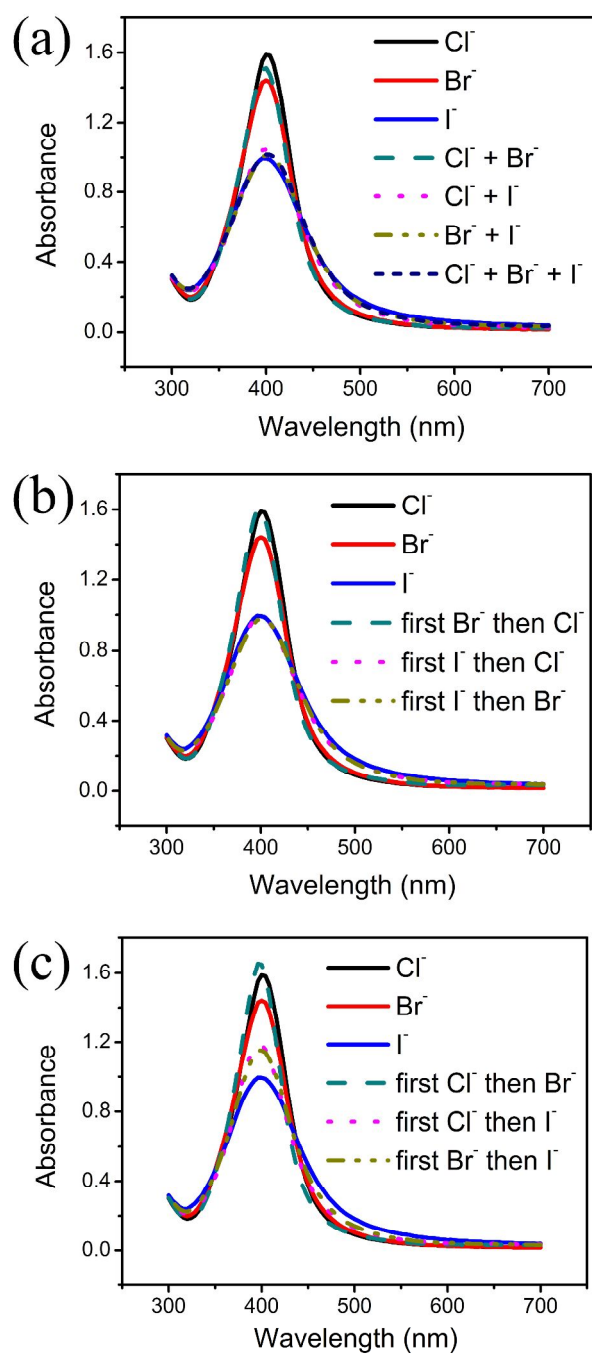


Figure S3. The optical spectra for the Cu@Ag NP solution in the presence of individual halides and mixtures of halides, pH 5.2.

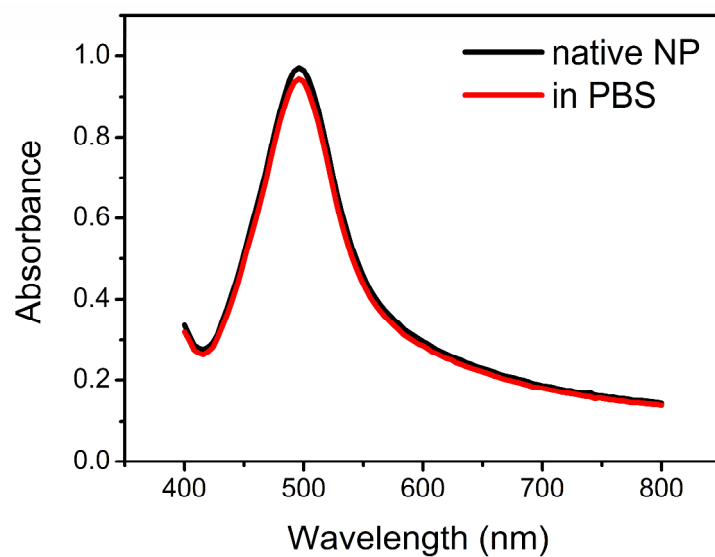


Figure S4. The optical spectra for the native Cu@Ag NP solution and the PBS buffered NP solution.

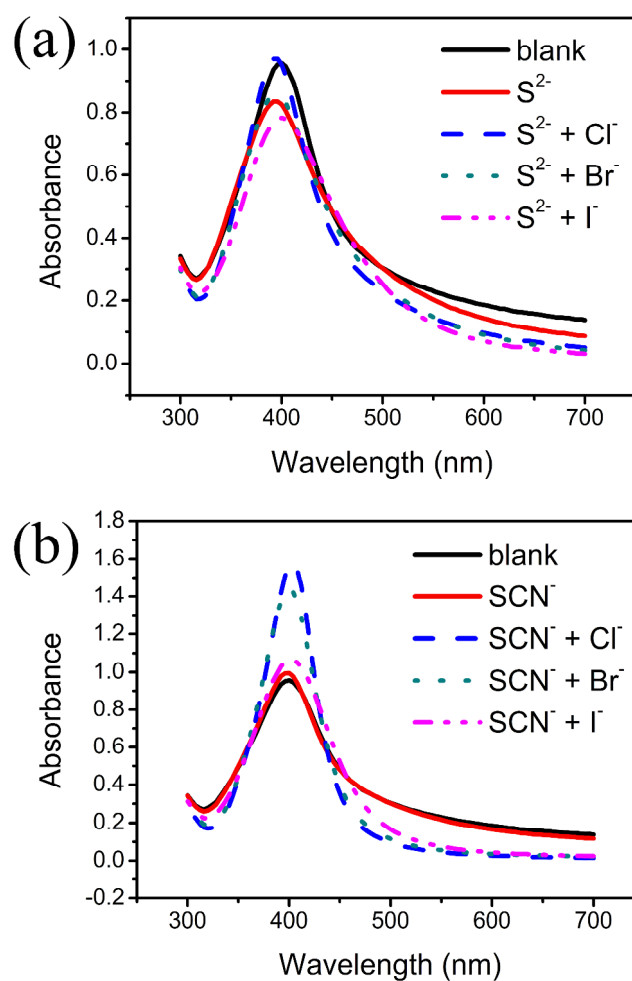


Figure S5. The optical spectra for the Cu@Ag NP solution in the presence of (a) sulfide and mixtures of sulfide with halides; (b) thiocyanate and mixture of thiocyanate with halides, pH 5.2.

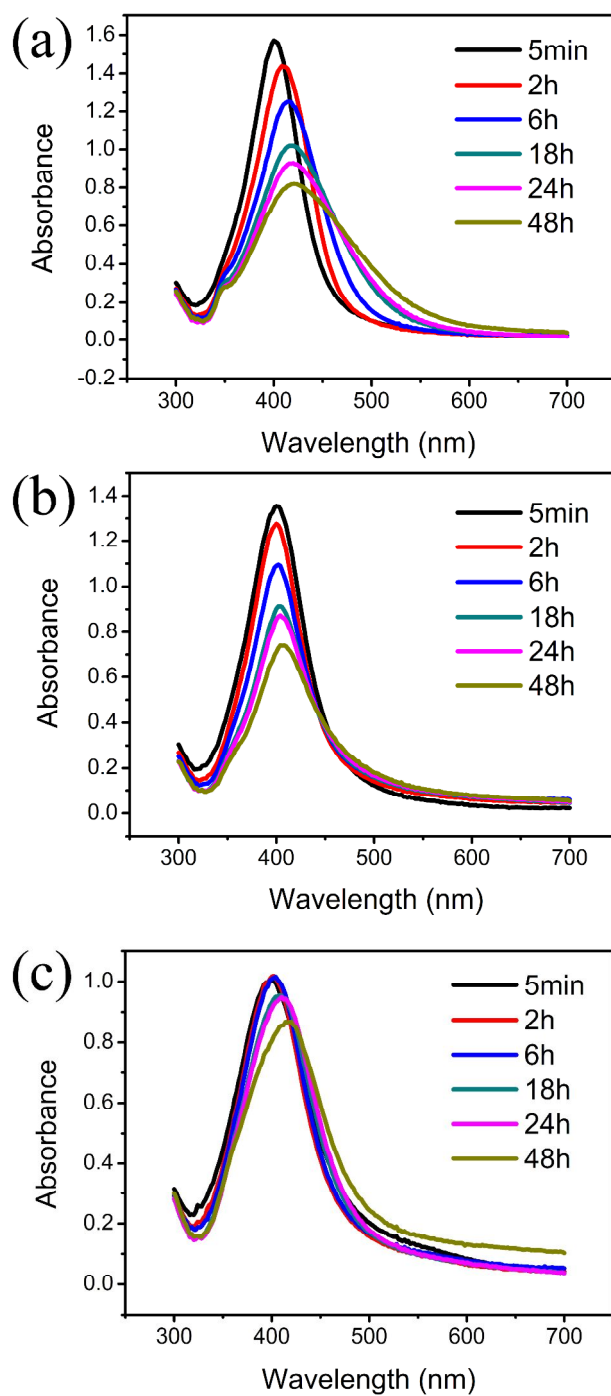


Figure S6. Time-dependent optical spectra of the Cu@Ag NP in the presence of (a) Cl⁻ (1 mM), (b) Br⁻ (10 μM), and (c) I⁻ (10 μM), pH 5.2.

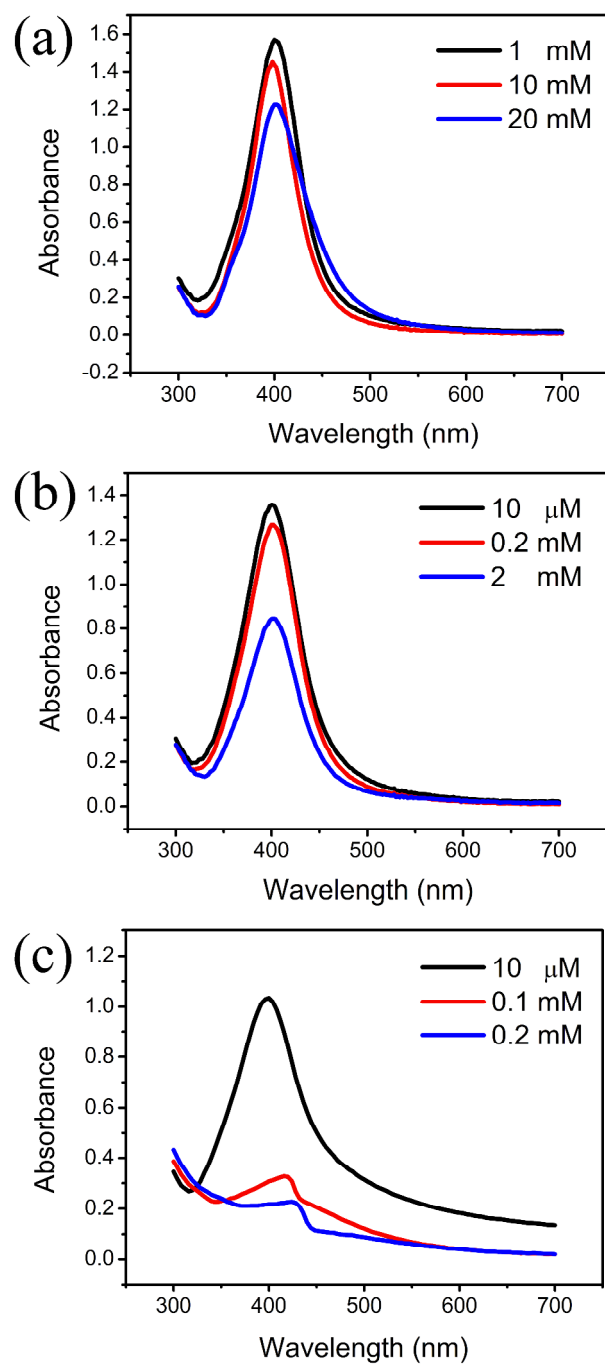


Figure S7. Concentration-dependent optical spectra of the Cu@Ag NP solution for (a) Cl^- , (b) Br^- , and (c) I^- anions, pH 5.2.

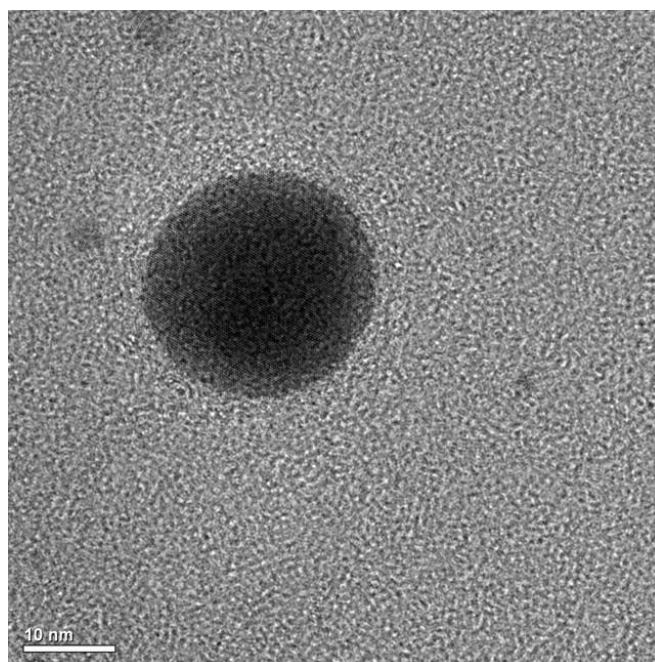


Figure S8. The enlarged TEM image of the Cu@Ag NP after interaction with iodide ($10\ \mu\text{M}$) for 2 h.

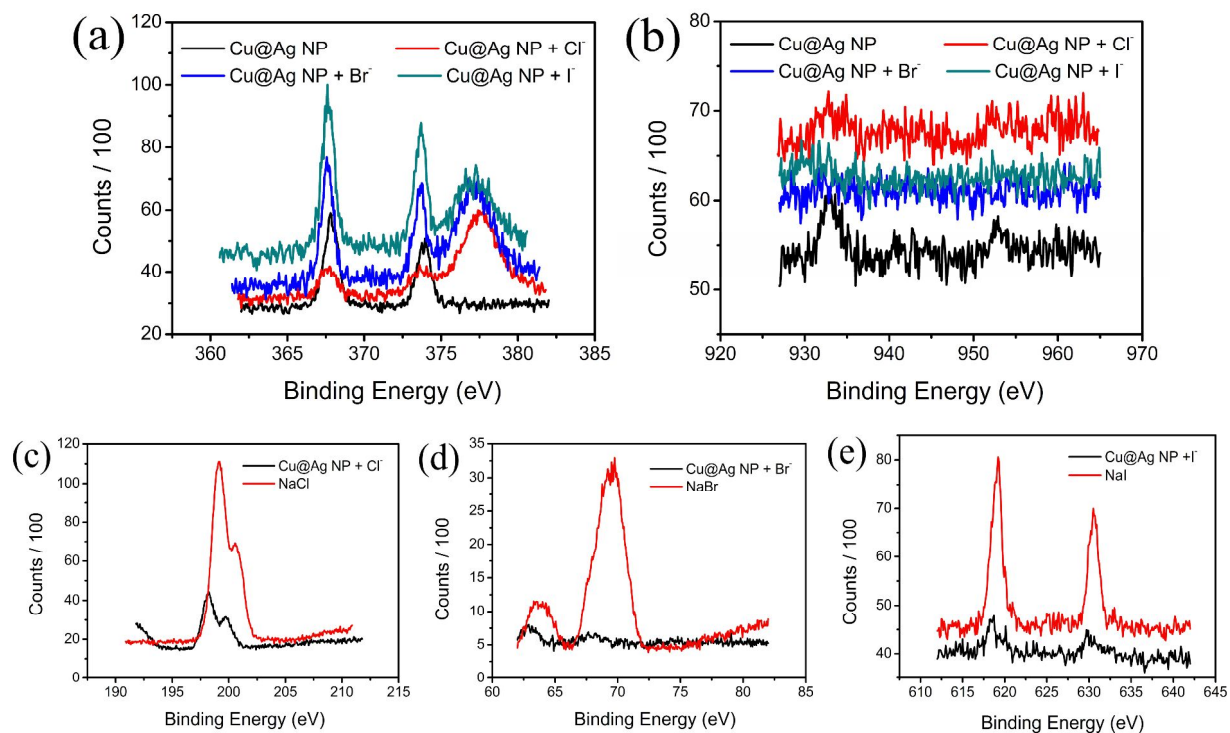


Figure S9. XPS spectra relative to (a) Ag and (b) Cu for the native Cu@Ag NP and the reorganized NP after interaction with halides. XPS spectra relative to (c) Cl⁻, (d) Br⁻, and (e) I⁻ for the reorganized NP after interaction with halides and the sodium halide salts.

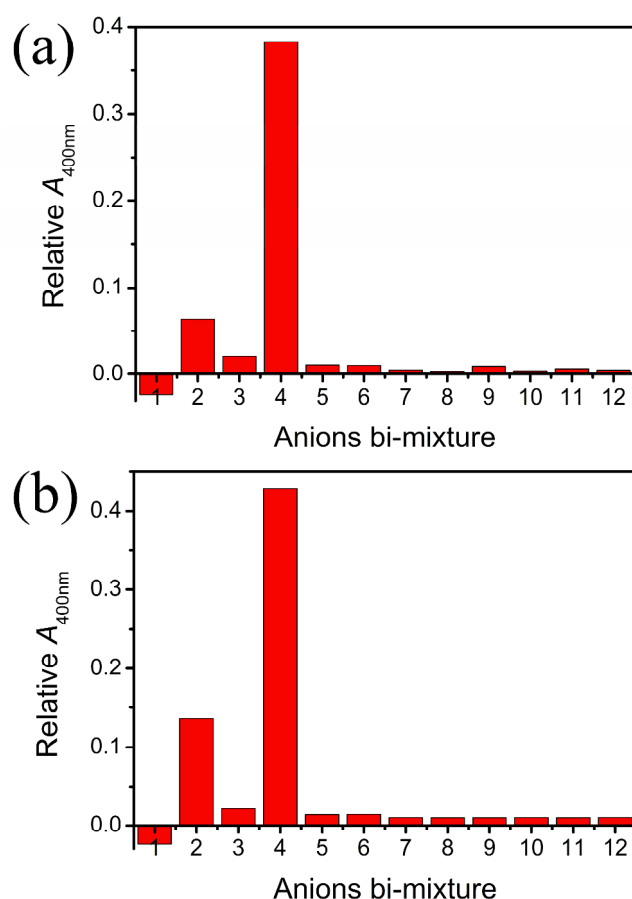


Figure S10. The manifestation of selectivity for the detection of (a) iodide (5 μM) and (b) sulfide (5 μM) in the presence of chloride (1 mM) and other anions. The other anion for 1-12 in (a) represents Cl^- (0.1 mM), Br^- (10 μM), SCN^- (10 μM), S^{2-} (10 μM), SO_3^{2-} , $\text{C}_2\text{O}_4^{2-}$, NO_3^- , NO_2^- , SO_4^{2-} , CO_3^{2-} , AcO^- , and HCOO^- (all 0.1 mM), respectively. The other anion for 1-12 in (b) represents Cl^- (0.1 mM), Br^- (10 μM), SCN^- (10 μM), I^- (10 μM), SO_3^{2-} , $\text{C}_2\text{O}_4^{2-}$, NO_3^- , NO_2^- , SO_4^{2-} , CO_3^{2-} , AcO^- , and HCOO^- (all 0.1 mM), respectively.