

Supplementary Information

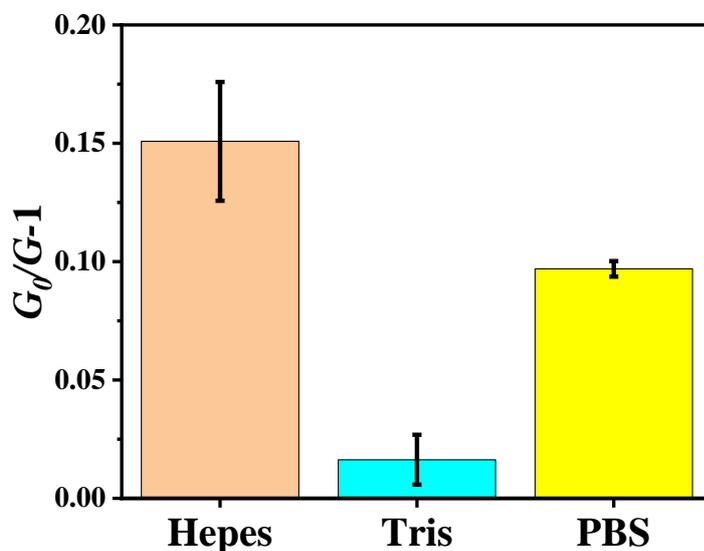


Figure S1. Influence of buffer system on quantum dot quenching effect. The effect of fluorescence quenching can be fitted by the following equation: $(G_0/G)-1$, G_0 is the gray value of the graph before the drop of Hg^{2+} is added, G is the gray value of the graph after the drop of $50 \mu\text{g/L}$ Hg^{2+} . All buffer system concentrations were 0.01M , pH were 7.5 . The experimental conditions were room temperature.

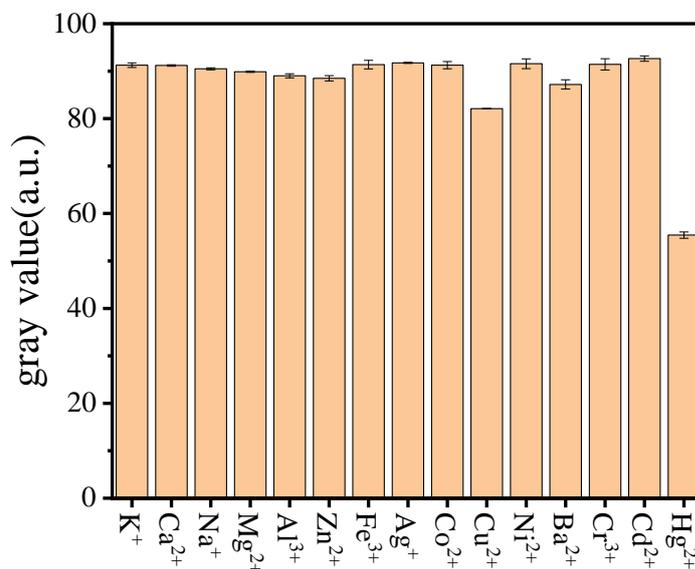


Figure S2. Selectivity for different interfering substances. The concentration of all interferents were $50 \mu\text{g/L}$. The experimental conditions were at room temperature and pH were 7.5 .

Table S1. Performance comparison with other reported methods for paper-based visual detection of Hg²⁺

Colorimetric system	Linear rang	LOD	Sample matrices	Referenc es
CdSe/ZnS QDs-based catalytic TMB oxidation	0.02-20.05 mg/L	18.05 µg/L	Cosmetic cream and tap water	[11]
MAA capped CdSAg QDs	24.87-160.47 mg/L	24.87 mg/L	Cosmetic acid solution	[27]
MOF/ CdTe QDs	10~5000 mg/L	0.22 mg/L	red wine	[28]
Rhodamine-Vinyl ether probe	10-200 mg/L	1mg/L	Tap water	[14]
N-CQDs	0.2-102.51mg/L	0.16 mg/L	Lake water r	[12]
AgNPs	40-1200 µg/L	10 µg/L	Industrial wastewater and river water	[10]
Paper-based QDs-SiO₂	5-100 µg/L	2.83 µg/L	Seawater and environmental water	This work