

Supporting Information

Pyridoxal derivative functionalized gold nanoparticles for colorimetric determination of zinc(II) and aluminium(III)

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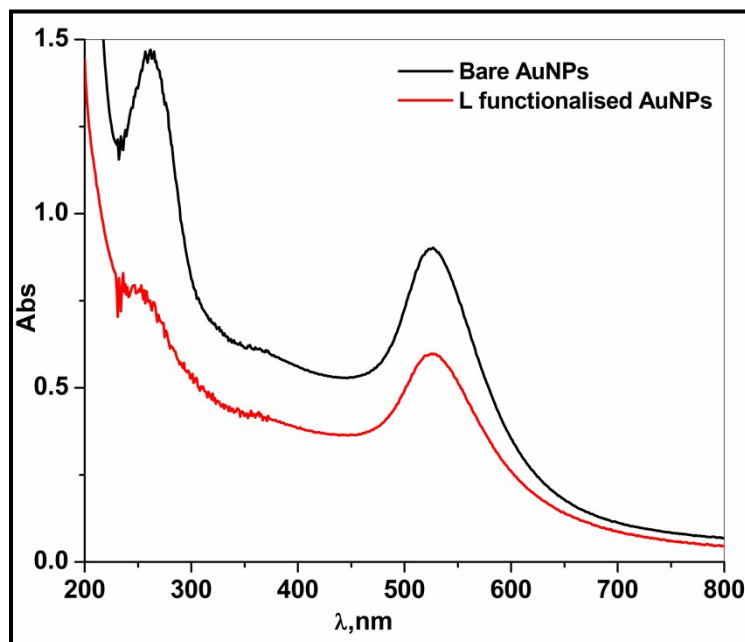


Fig. 1S. UV-Vis spectrum of bare and L-AuNPs.

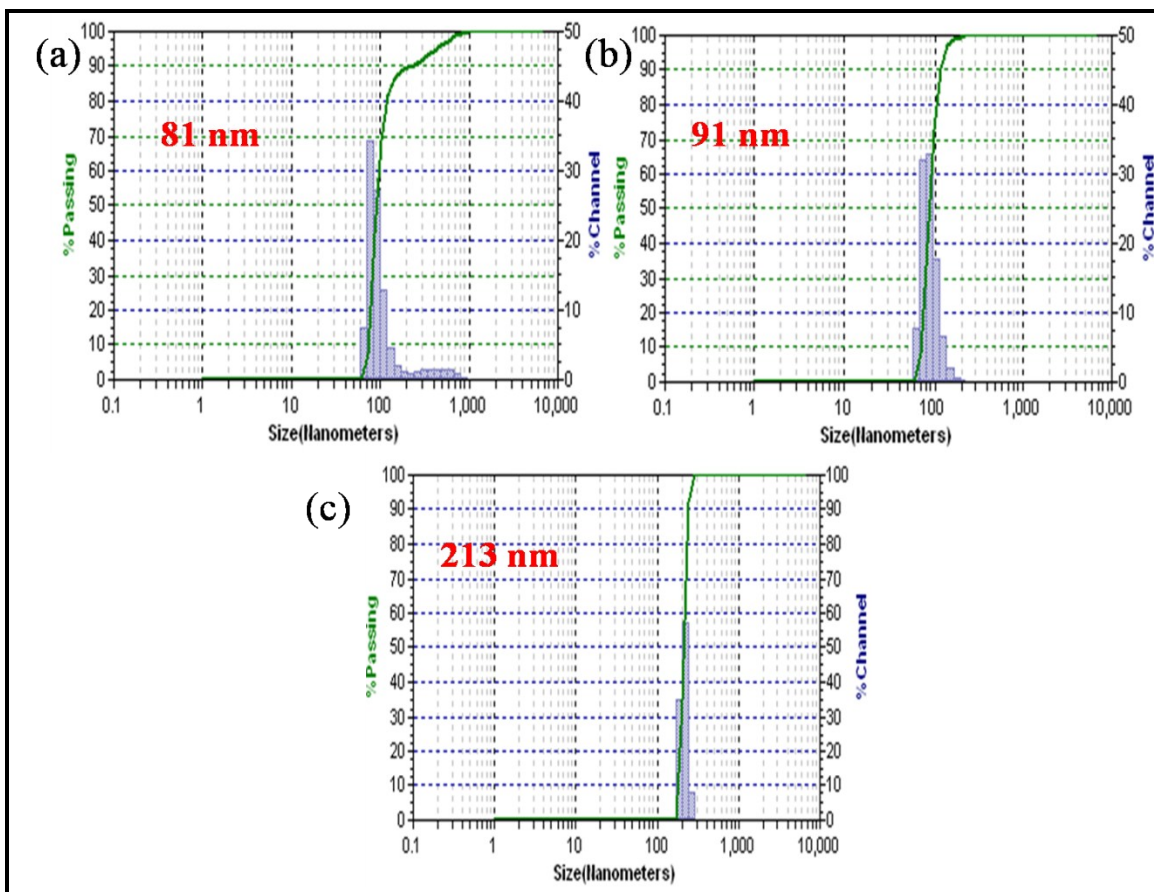


Fig. 2S. DLS spectra of (a) bare AuNPs , (b) L- AuNPs and (c) L- AuNPs in presence of Al³⁺.

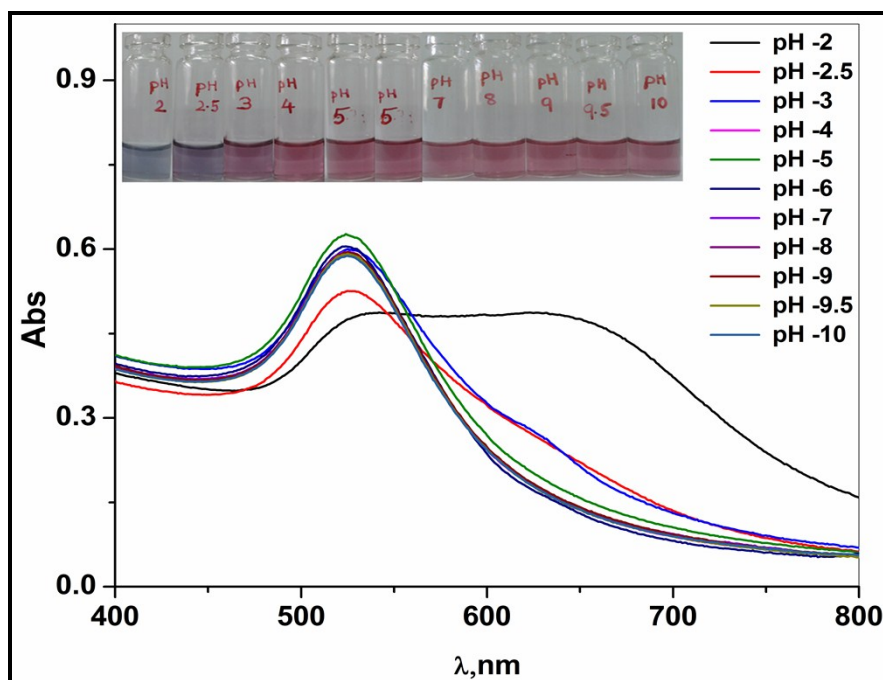


Fig. 3S. UV-Vis spectral observations of L-AuNPs at different pH. Inset showing the change in color of nanoparticles from red to blue in acidic medium.

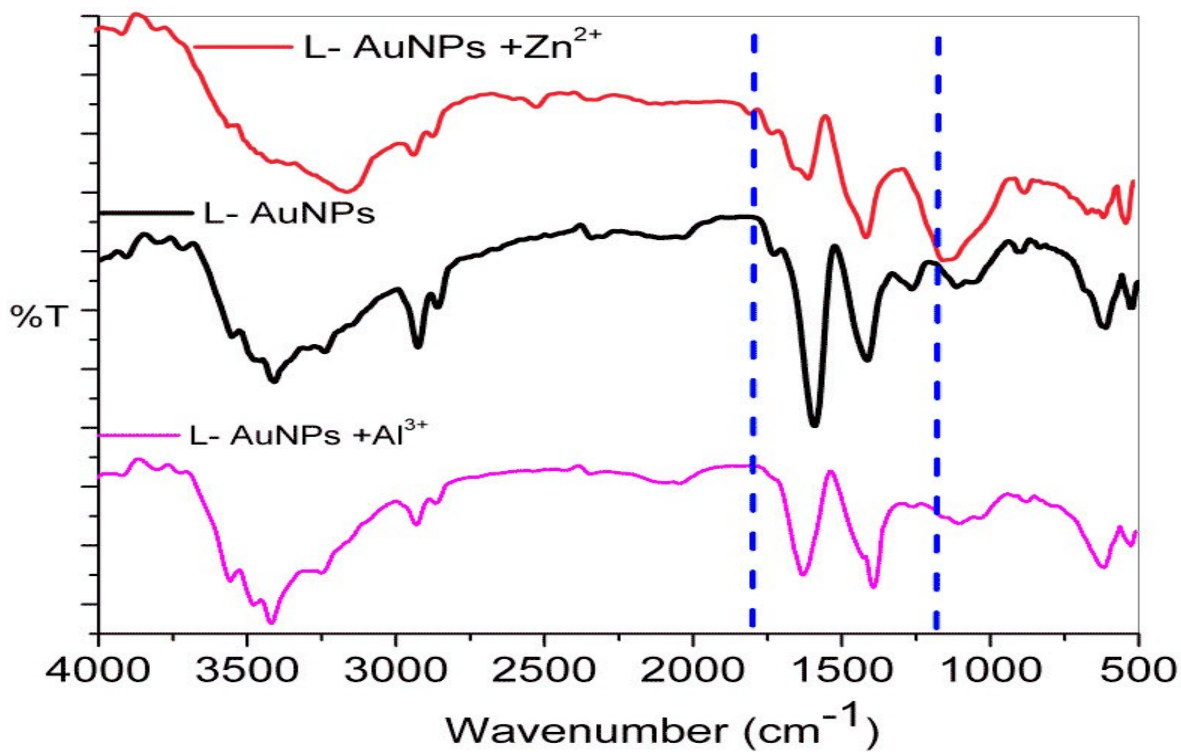


Fig. 4S. FT-IR spectra of L-AuNPs alone and in the presence of Al^{3+} and Zn^{2+} .

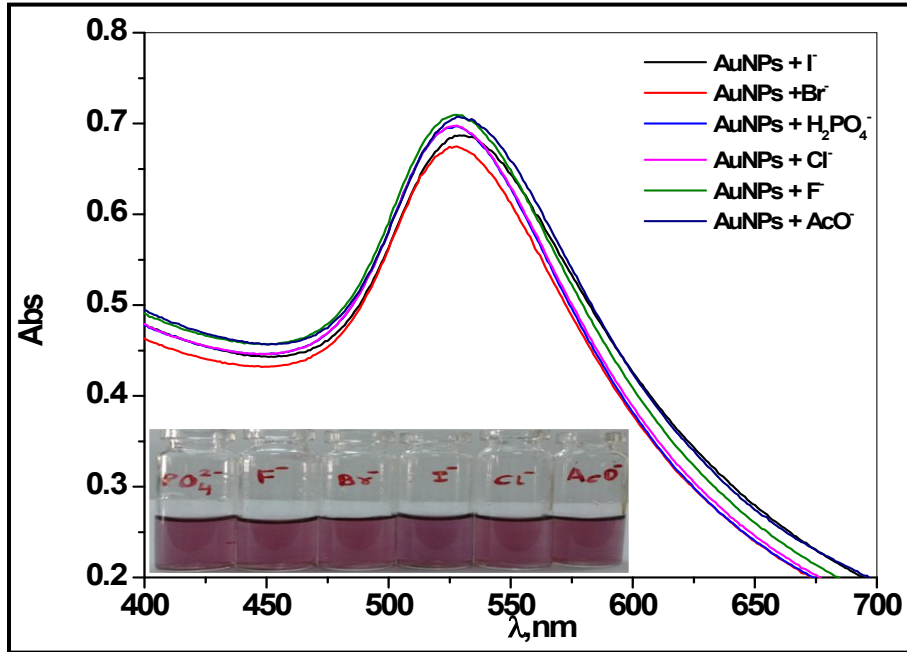


Fig. 5S. Selectivity study of L- AuNPs with different anions (5.0×10^{-4} M).

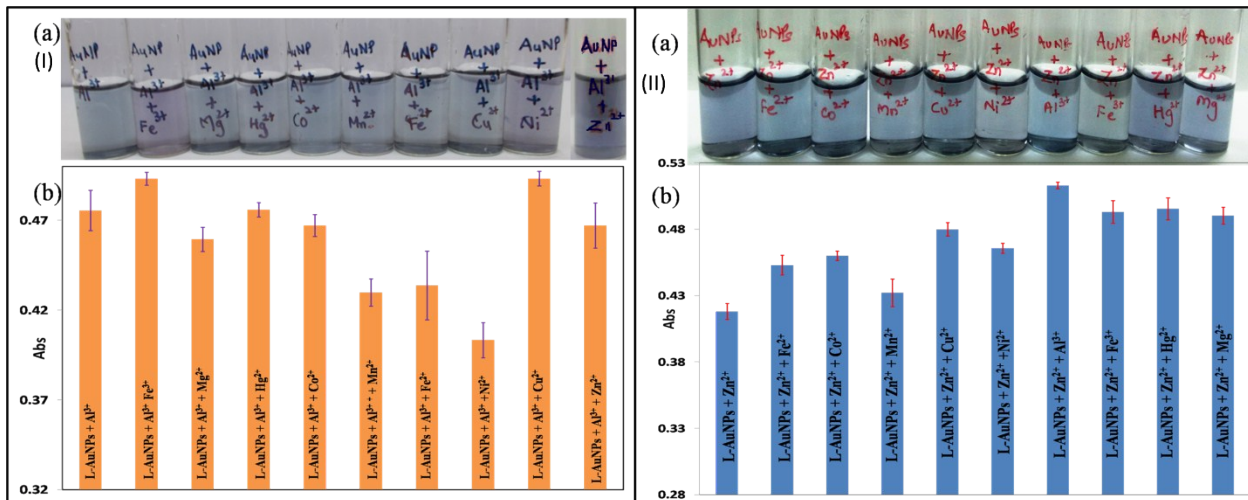


Fig. 6S. Interference experiments of L-AuNPs to detect (I) Al^{3+} and (II) Zn^{2+} in the presence of different metal ions.

Table 1S. Results of the determination of Al³⁺ and Zn²⁺ in water samples.

Spiked samples	[Al ³⁺ /Zn ²⁺] Added (10 ⁻⁴) M	[Al ³⁺ /Zn ²⁺] Found (10 ⁻⁴) M	R%
Al1	1.32	1.57	118.9
Al2	1.96	1.78	90.8
Al3	2.59	1.93	74.5
Al4	3.23	3.35	103.7
Zn1	1.315	1.254	95.3
Zn2	1.96	1.597	81.4
Zn3	2.59	2.34	90.3
Zn4	3.23	3.50	108.3

Table 2S. Comparison of present colorimetric approach using L-AuNPs with the reported methods for detection of Al³⁺.

NPs	Linear range (M)	LOD (M)	Ref. no. (See main text)
L-AuNPs	66.2 to 322 μM	0.51 μM	This study
Cit-AuNPs	-	1.0 μM	[27]
CALNN-AuNPs	0.5 to 6 μM	0.2 μM	[28]
Mononucleotide-AuNPs	2.0 to 6 μM	0.46 μM	[29]
Triazole-ether-AuNPs	0.5 to 5 μM	18.0 nM	[30]

Table 3S. Comparison of present colorimetric approach using L-AuNPs with the reported methods for detection of Zn²⁺.

NPs	Linear range (M)	LOD (M)	Ref. no. (See main text)
L-AuNPs	66.2 to 445 μM	0.74 μM	This study
Cht-AuNPs	0-75 μM	18 μM	[31]
Dithiol surfactants - AuNPs	-	-	[32]
Polypeptide- AuNPs	1.5–2 mM	-	[33]
Peptide- AuNPs	24 nM–1.2 mM	10 nM	[34]
bis(pyridine-2-ylmethyl)phenyl-AuNPs	1.0 to 30.0 μM	2 ppm	[35]