

Supporting Information

Selective Interactions of Al(III) with Plasmonic AgNPs by Colorimetric, Kinetic and Thermodynamic Studies

Ritu Painuli[†], Sapna Raghav[†], and Dinesh Kumar^{†,‡}

[†]Department of Chemistry, Banasthali Vidyapith, Banasthali, Tonk 304022, Rajasthan, India,

[‡]School of Chemical Sciences, Central University of Gujarat, Gandhinagar 382030, Gujarat, India

Contents

Figure S1. Effect of pH **(a)** on the synthesis, and **(b)** stability of prepared 5H-I2CA@AgNPs. Inset of figure shows the change in their solutions;

Figure S2. **(a)** UV-vis spectra of the AgNPs prepared at different temperatures, inset shows the photographs of the corresponding solutions, and **(b)** different concentrations of 5H-I2CA, inset shows colorimetric changes at different concentrations of 5H-I2CA;

Figure S3. **(a & b)** Represent the calculation of FWHM of 5H-I2CA@AgNPs synthesized at different concentrations of 5H-I2CA;

Figure S4. FTIR spectra of (a) 5H-I2CA, (b) 5H-I2CA@AgNPs, (c) 5H-I2CA@AgNPs + Al(III);

Figure S5. **(a-c)** size distribution of 5H-I2CA@AgNPs before and after the addition of Al(III) ions;

Figure S6. **(a)** SPR spectra of 5H-I2CA@AgNPs after the addition of various concentration of Al(III) ions on to the tap water, **(b)** Colorimetric response of the synthesized of 5H-I2CA@AgNPs in tap water, **(c)** Plot of absorbance intensity difference versus concentrations of Al(III) ions in tap water samples.

Table S1. The comparison table demonstrating LOD's of available probes for the detection of the Al(III)

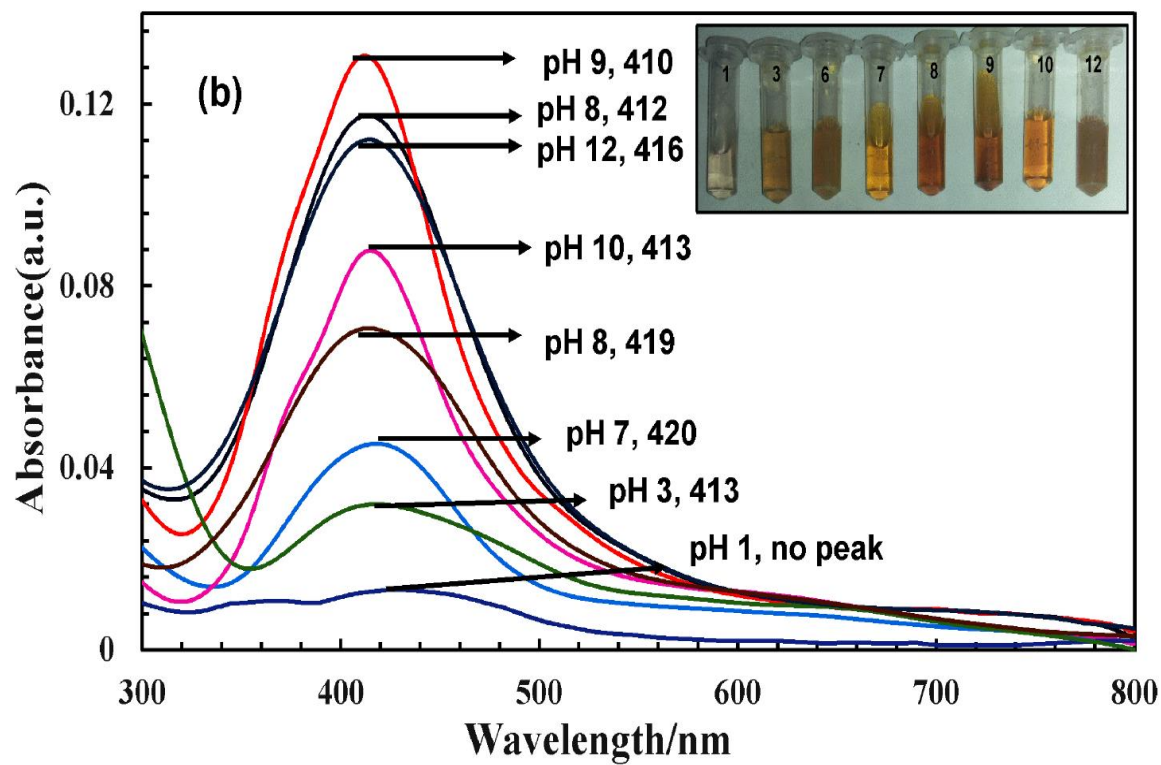
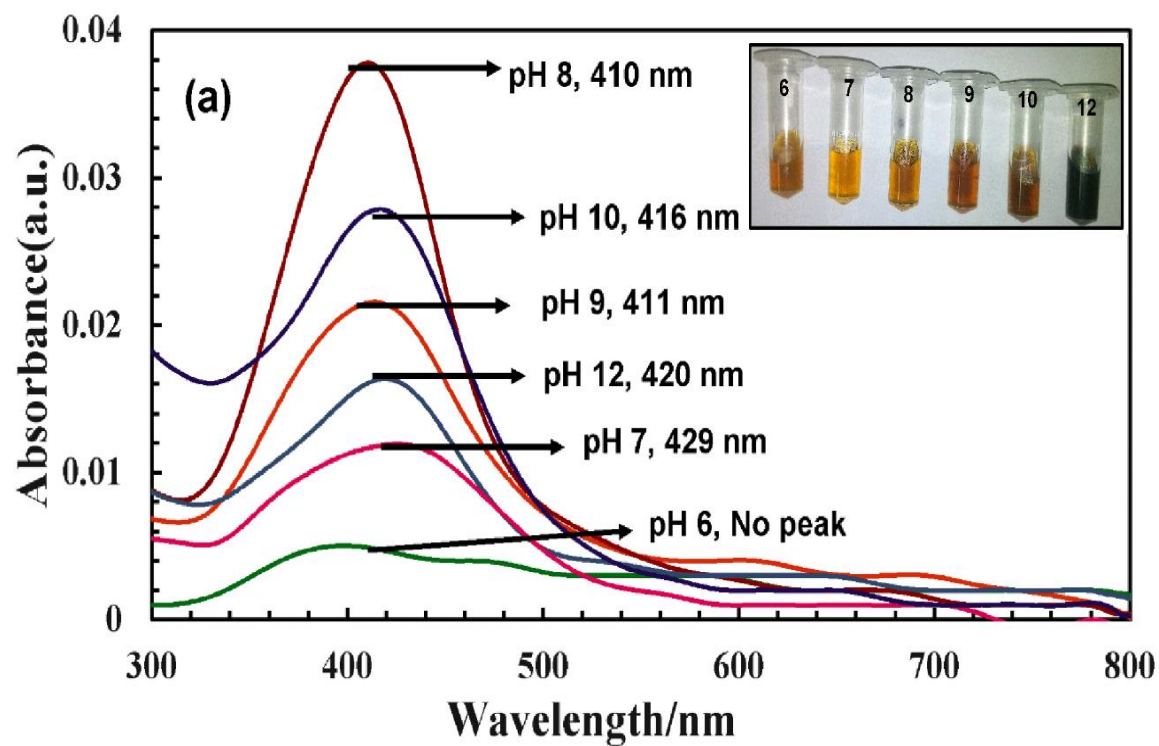


Figure S1. Effect of pH (a) on the synthesis, and (b) stability of prepared 5H-I2CA@AgNPs. Inset of figure shows the change in their solutions.

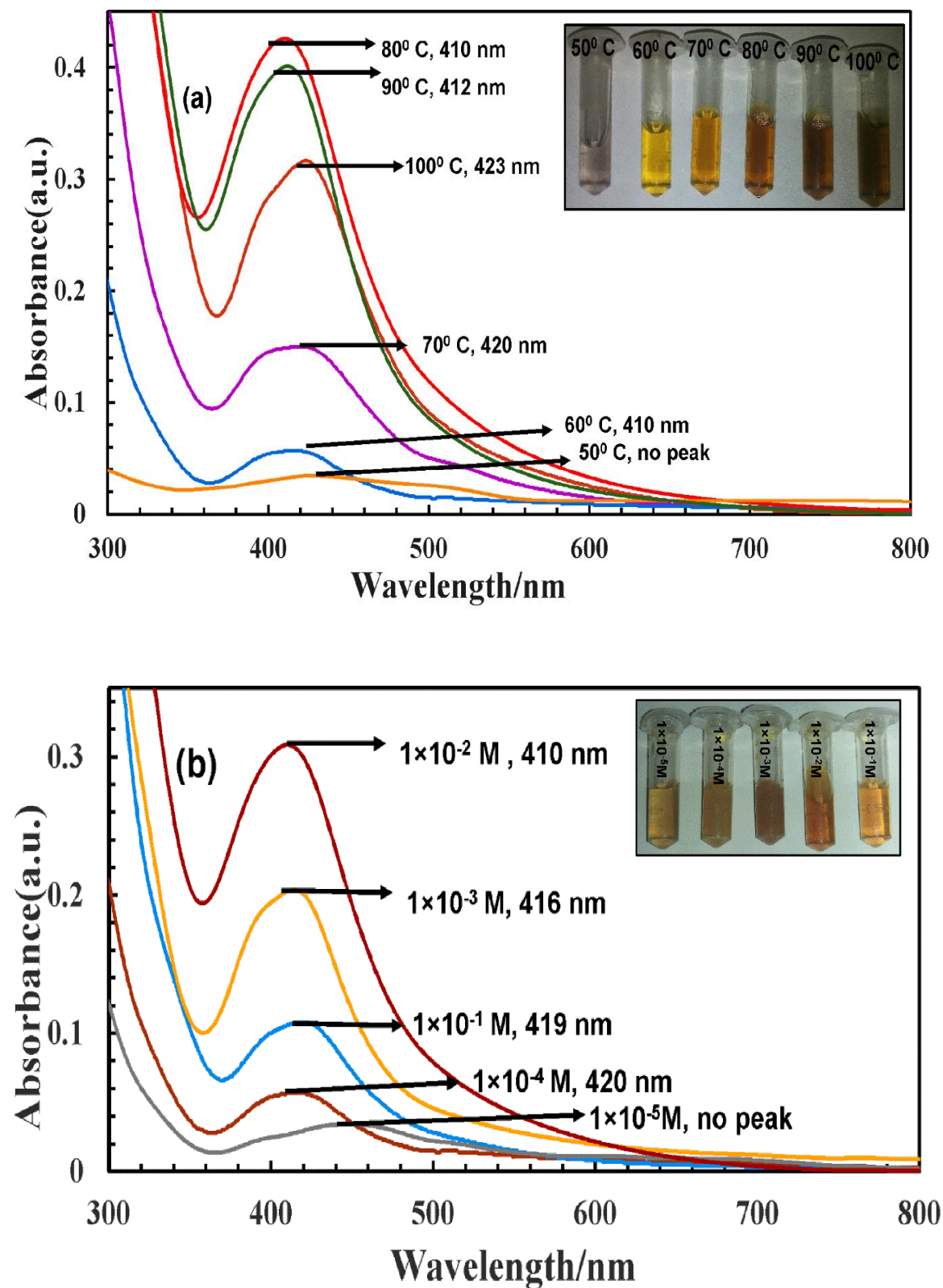
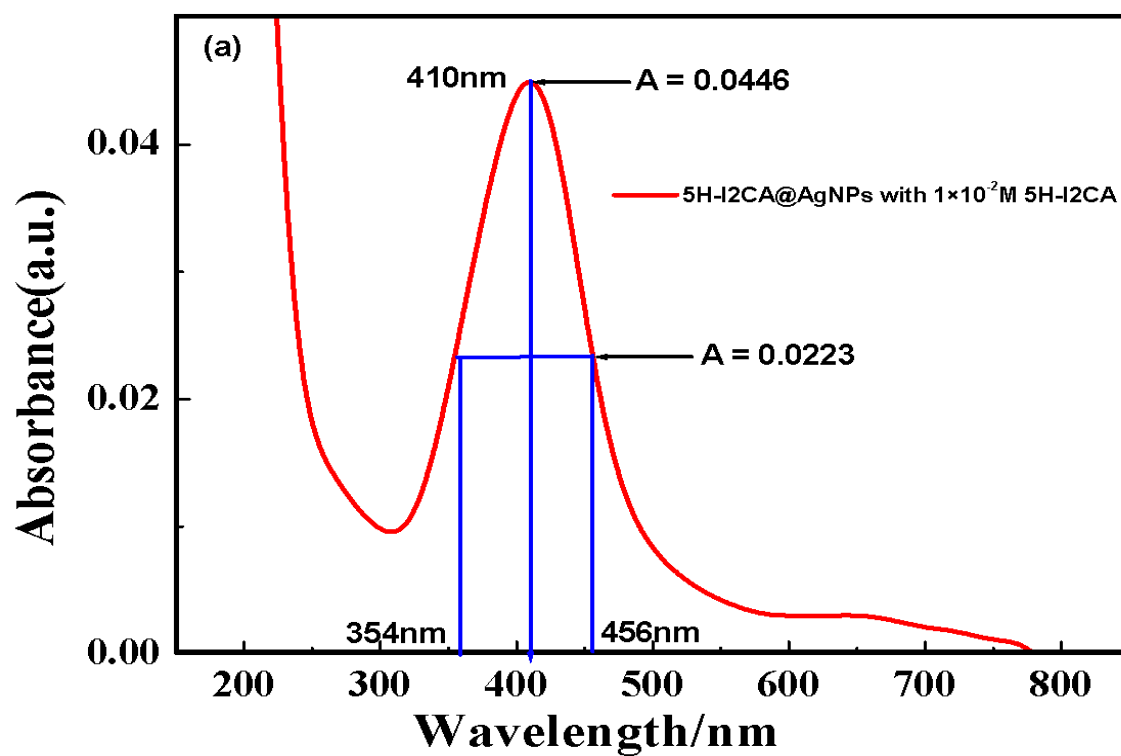


Figure S2. (a) UV-vis spectra of the AgNPs prepared at different temperatures, inset shows the photographs of the corresponding solutions, and (b) different concentrations of 5H- I2CA, inset shows colorimetric changes at different concentrations of 5H-I2CA.



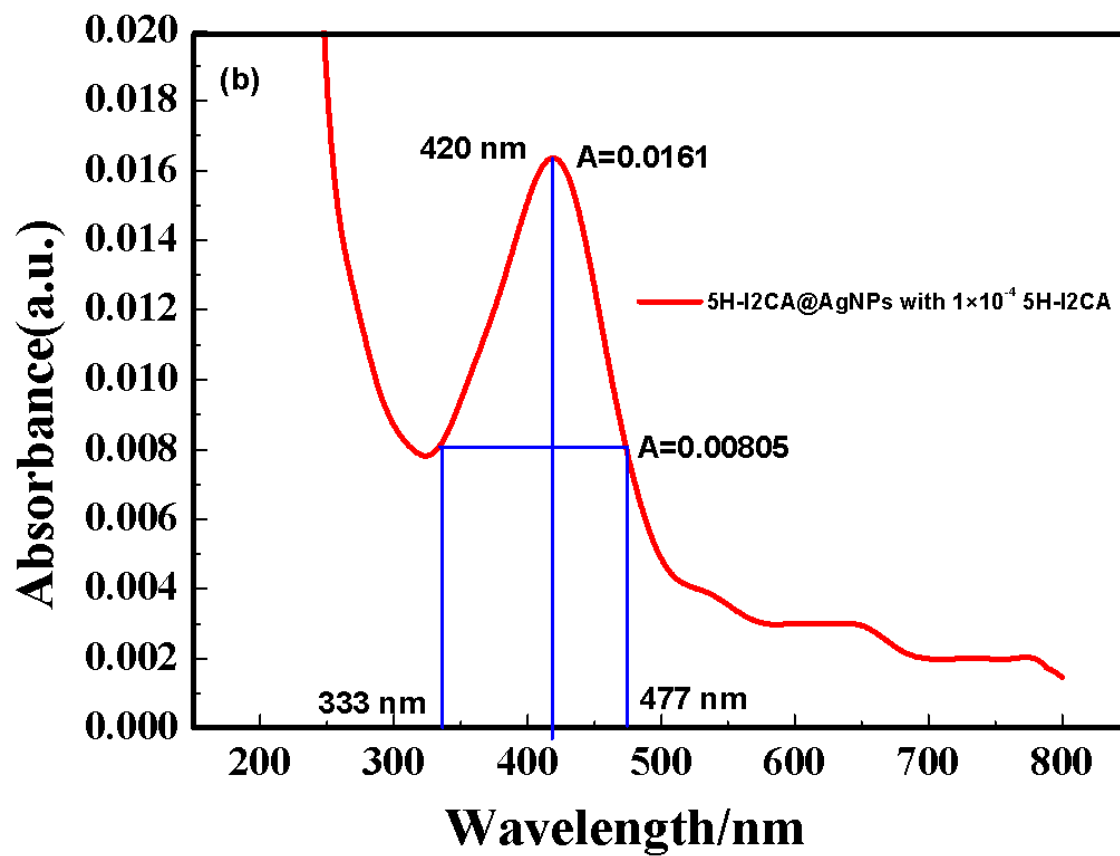


Figure S3. (a & b) Represent the calculation of FWHM of 5H-I2CA@AgNPs synthesized at different concentration of 5H-I2CA.

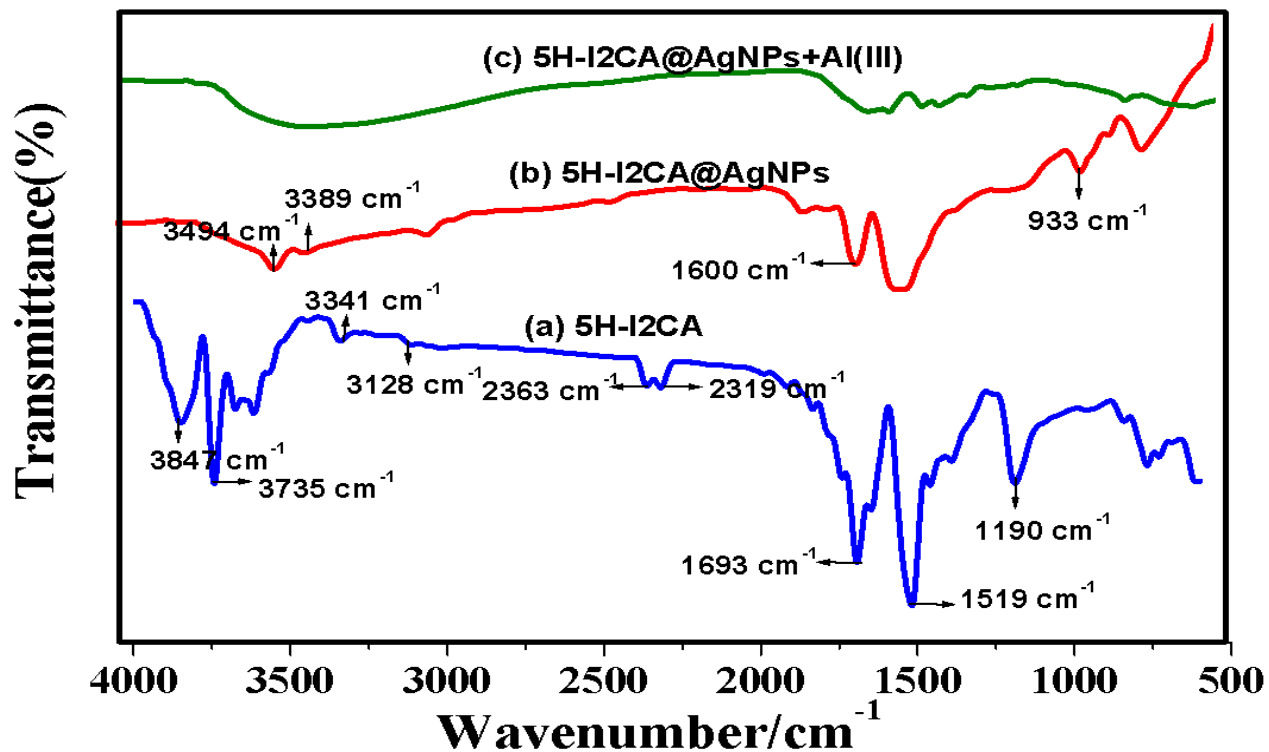
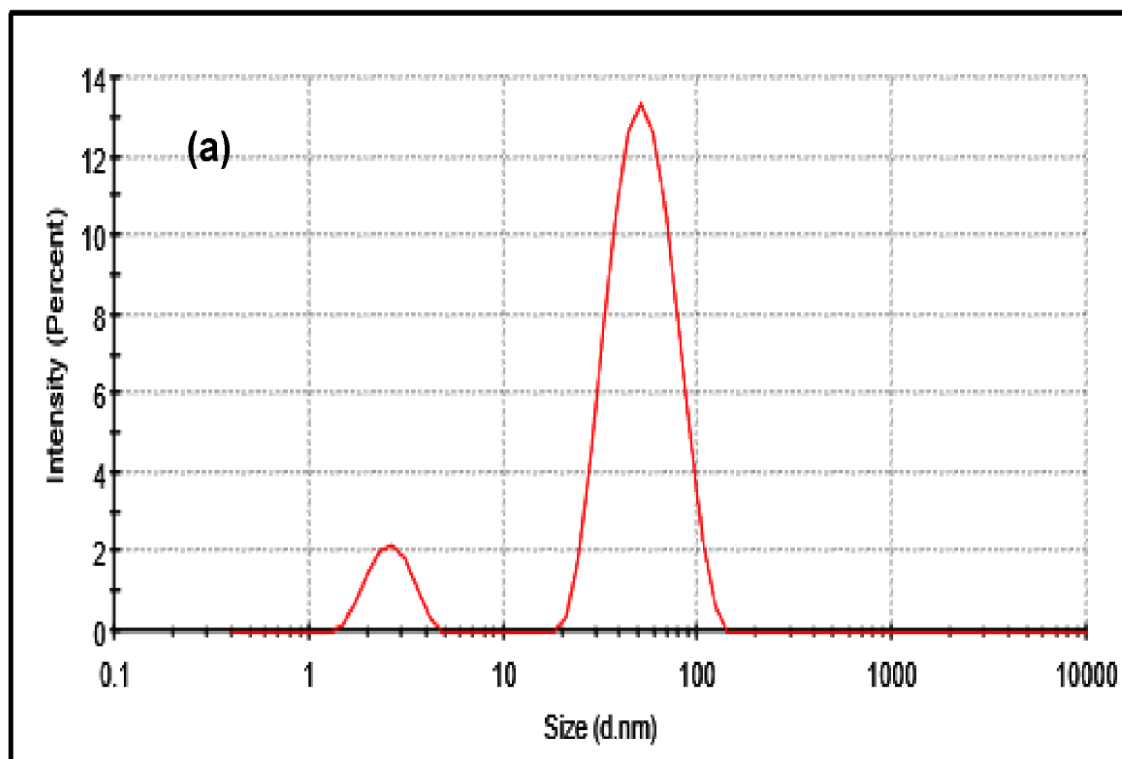


Figure S4. FTIR spectra of (a) 5H-I2CA, (b) 5H-I2CA@AgNPs, (c) 5H-I2CA@AgNPs+Al(III).



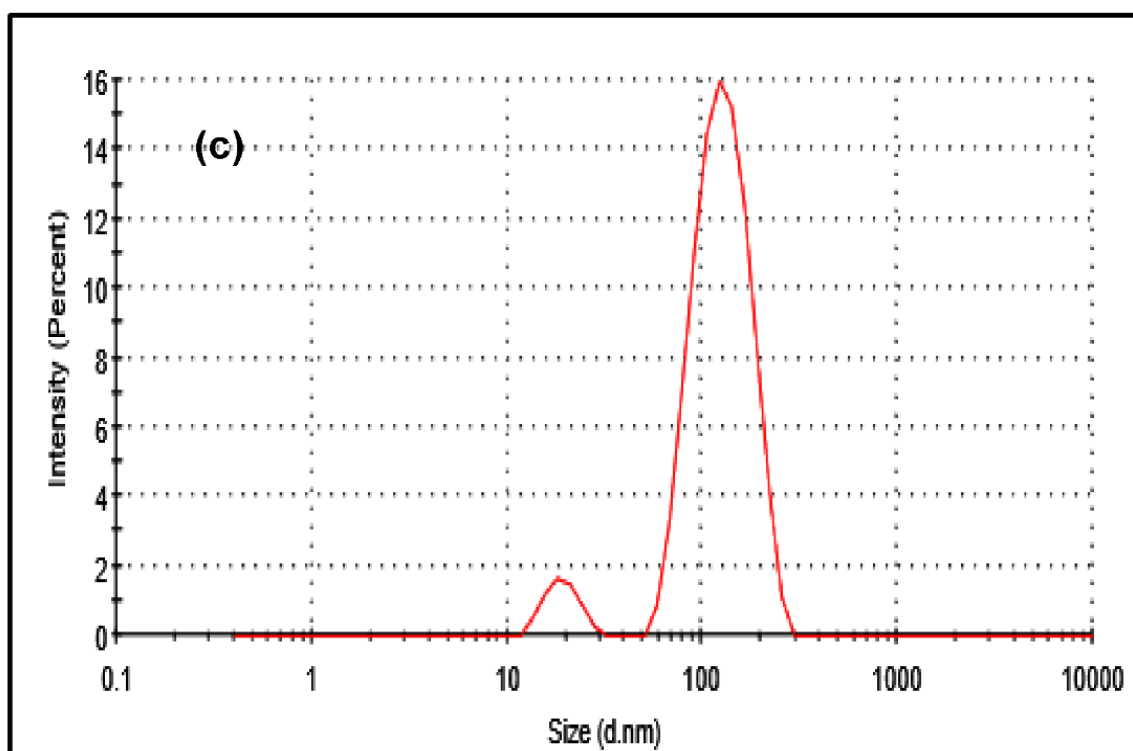
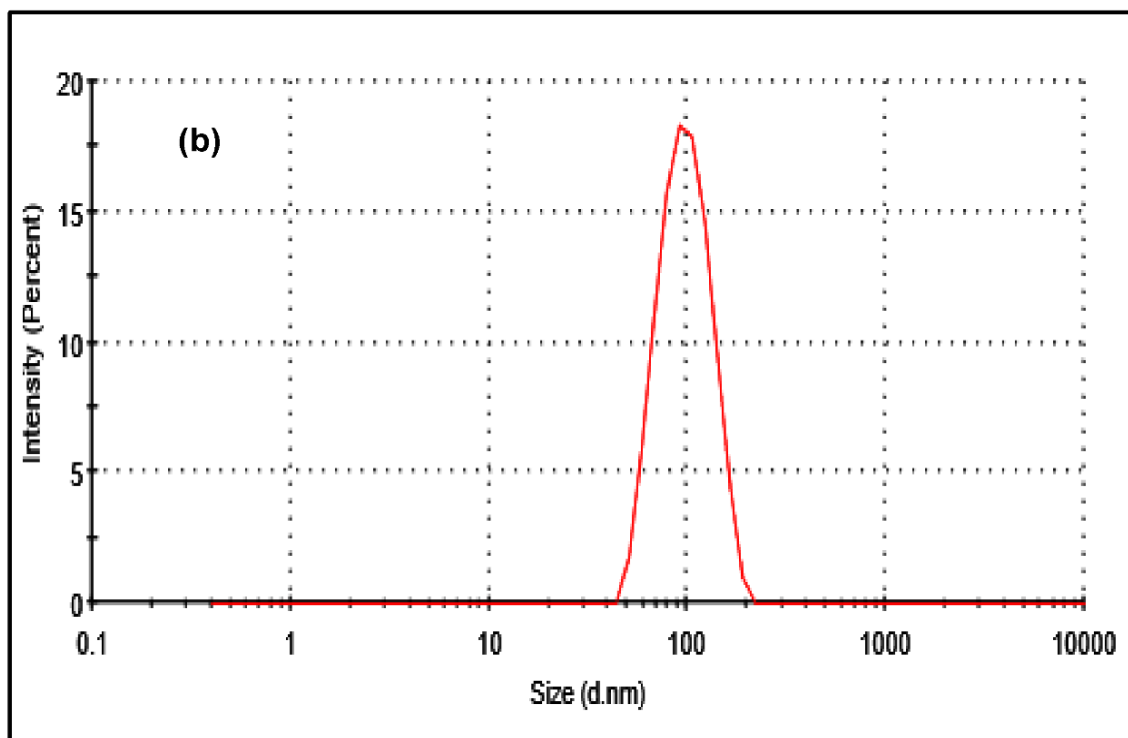
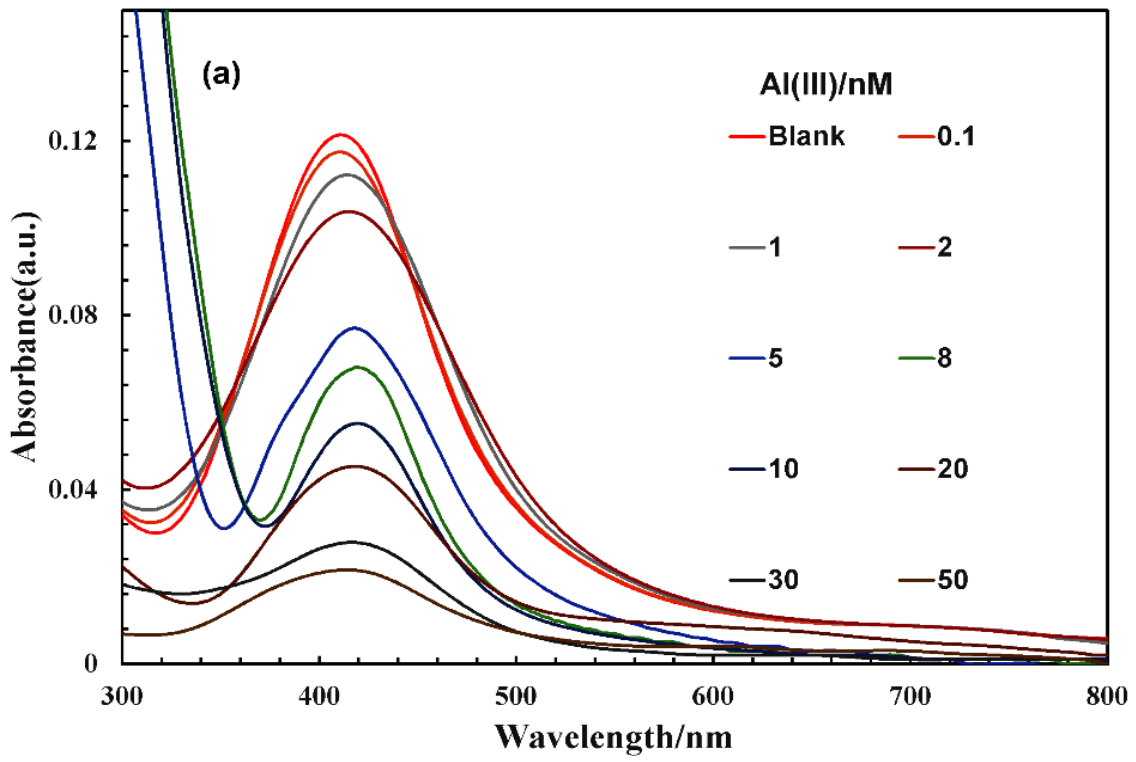


Figure S5. (a-c) Size distribution of 5H-I2CA@AgNPs before and after the addition of Al(III) ions.



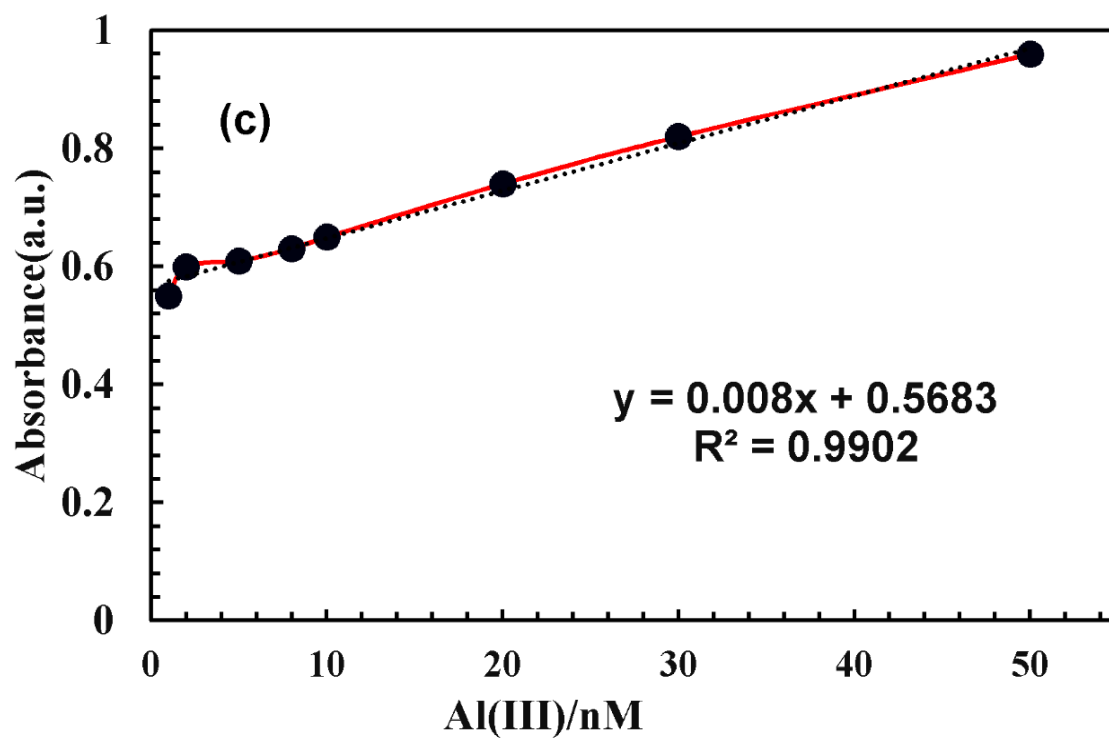
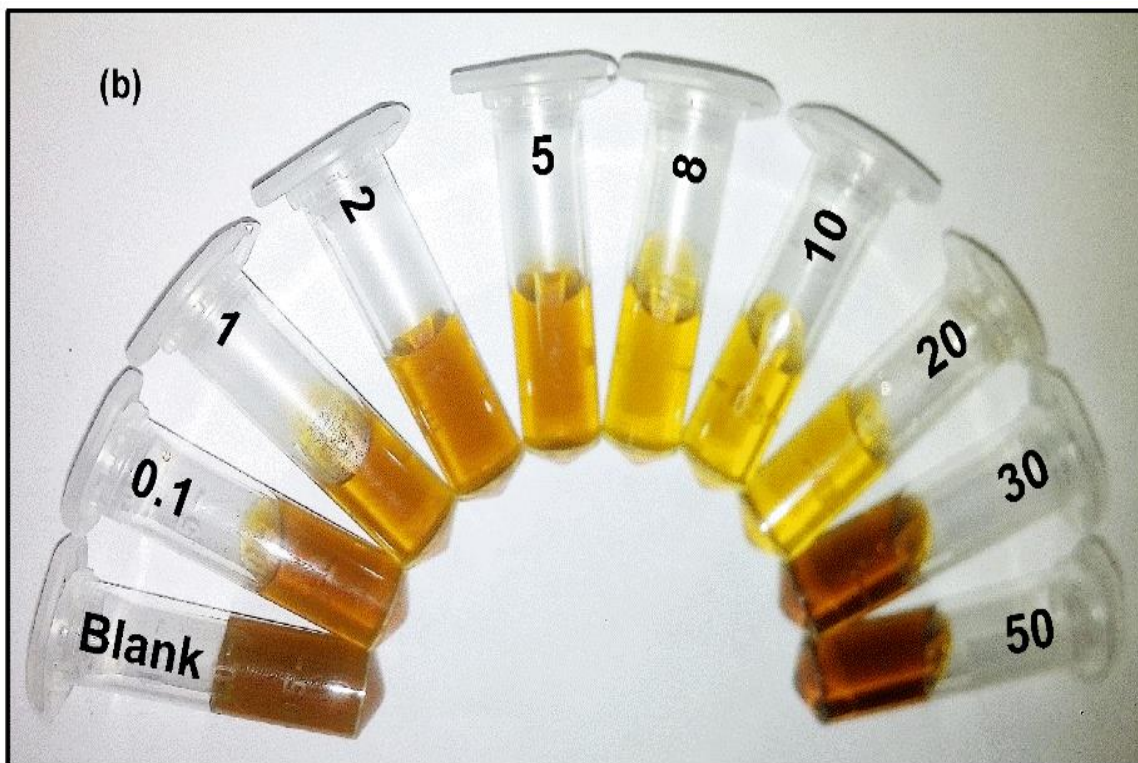


Figure S6. (a) SPR spectra of 5H-I2CA@AgNPs after the addition of various concentration of Al(III) ions on to the tap water, (b) Colorimetric response of the synthesized of 5H-I2CA@AgNPs

in tap water, (c) Plot of absorbance intensity difference versus concentrations of Al(III) ions in tap water samples.

Table S1. The comparison table demonstrating LOD's of available probes for the detection of the Al(III).

Method	Sensing probe	Reducing agent	Stabilizing agent	LOD
Colorimetric	AuNPs ³⁵	NaBH ₄	MMT	0.53 μM
Colorimetric	AuNPs ³⁶	NaBH ₄	Triazole ether	18 nM
Colorimetric	AuNPs ³⁷	NaBH ₄	Ionic Liquid	1 μm
Colorimetric	AgNPs ³⁸	I2CA	I2CA	0.01 ppm
Colorimetric	AuNPs ⁵⁴	Citrate	Citrate	1 μM
Colorimetric	AgNPs ⁵⁵	Mentha	Mentha	1 nM
Colorimetric	AgNPs	5H-I2CA	5H-I2CA	1nM
	(This work)			