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<sup>35</sup> | NaBH<sub>4</sub> | MMT | 0.53 µM |
| Colorimetric| AuNPs<sup>36</sup> | NaBH<sub>4</sub> | Triazole ether | 18 nM |
| Colorimetric| AuNPs<sup>37</sup> | NaBH<sub>4</sub> | Ionic Liquid | 1 µm |
| Colorimetric| AgNPs<sup>38</sup> | I2CA | I2CA | 0.01 ppm |
| Colorimetric| AuNPs<sup>54</sup> | Citrate | Citrate | 1 µM |
| Colorimetric| AgNPs<sup>55</sup> | Mentha | Mentha | 1 nM |
| Colorimetric| AgNPs | 5H-I2CA | 5H-I2CA | 1nM |
| **(This work)** | | | | |