Electronic Supplementary Material (ESI) for Analyst.

Supporting Information

Exploiting the Chemical Differences Between Ag and Au Colloids Allows Dramatically Improved SERS Detection of "Non-adsorbing" Molecules

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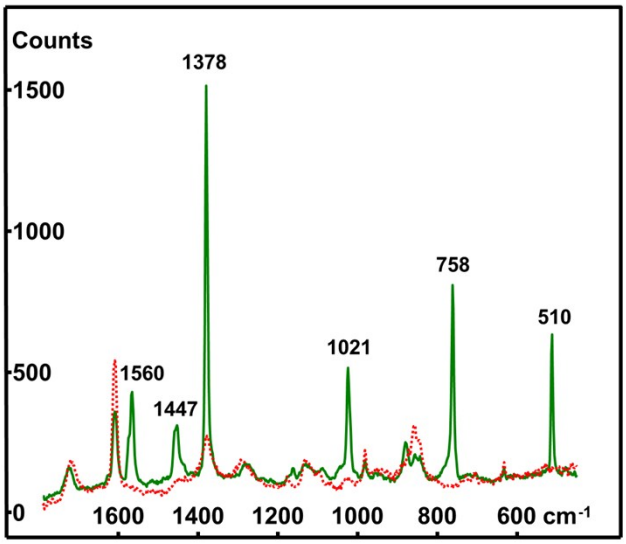

Figure S1.SERS spectrum of 10^{-4} M naphthalene obtained using commercial citrate-capped gold colloid aggregated with $(NH_4)_2SO_4$. Dotted spectrum shows the blank SERS background of the colloid.

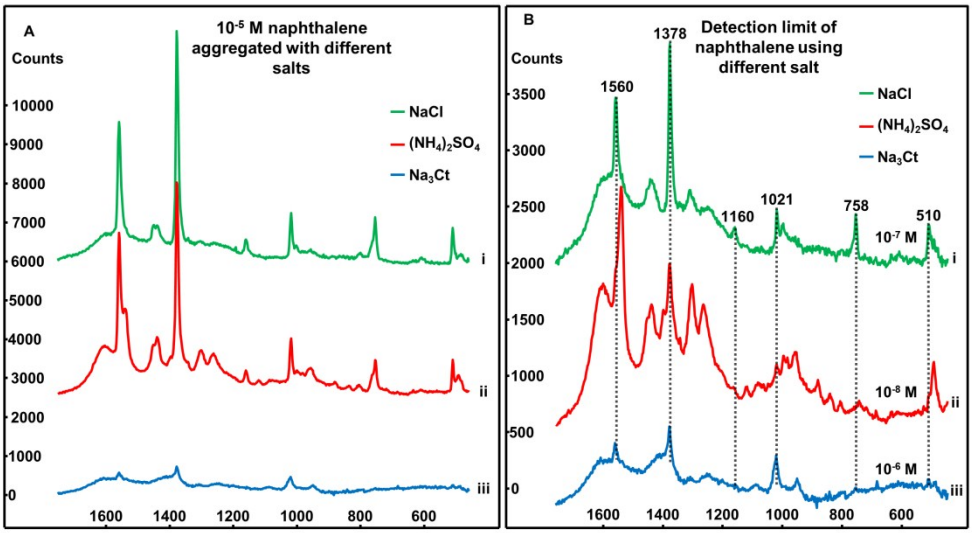

Figure S2.A: SERS signals of naphthalene at 10^{-5} M obtained with CRGC using different aggregating agents. B: SERS spectra of naphthalene obtained at the lowest detectable concentration using different aggregating agents. The final detectable concentration of naphthalene was 10^{-7} M, 10^{-8} M and 10^{-6} M when using NaCl, $(NH_4)_2SO_4$ and Na_3Ct, respectively.

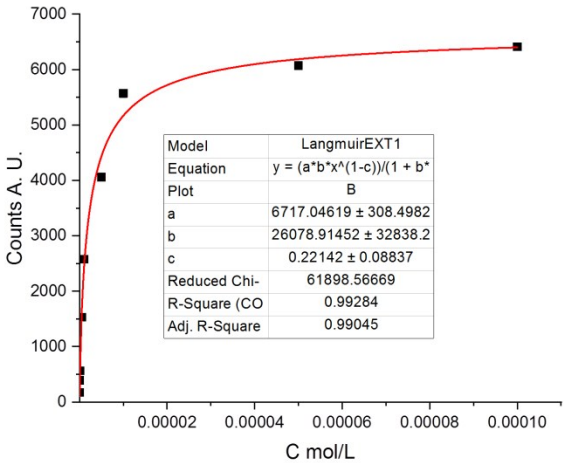

Figure S3.SERS signal intensity of the naphthalene (1560 cm^{-1} peak) plotted against the final concentration of naphthalene fitted with the Langmuir model for adsorption.

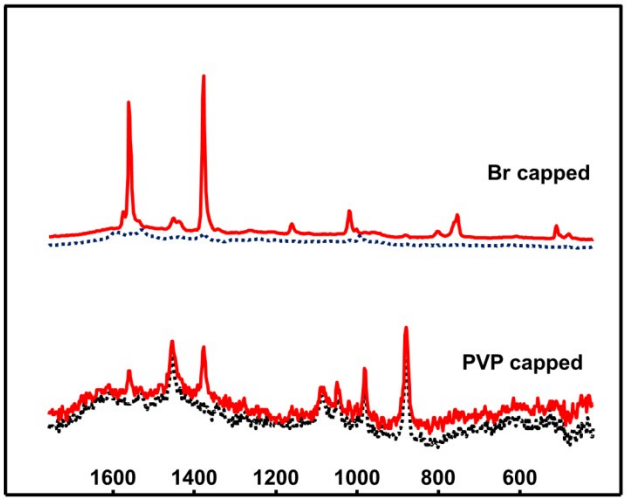

Figure S4.SERS spectra of 10^{-4} M naphthalene obtained using CRGC capped with bromide and PVP. Dotted spectra show the blank SERS signals of the colloid.

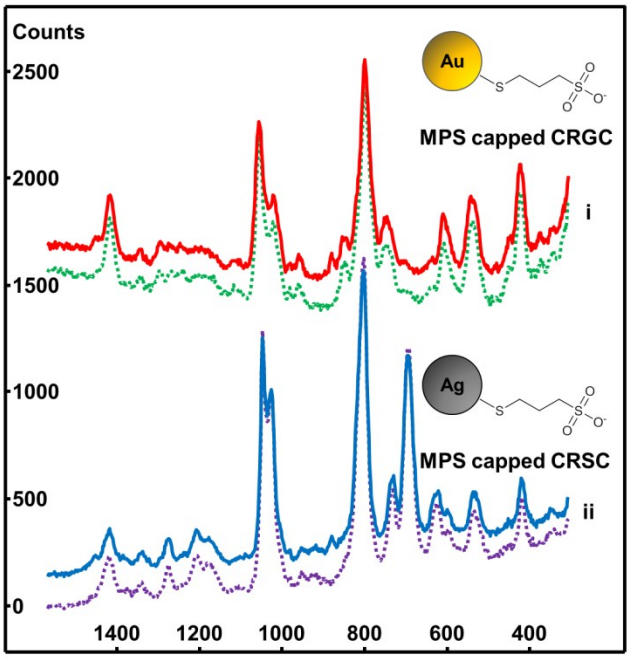

Figure S5.Dotted spectra show the blank SERS signals of mercaptopropane sulfonate (MPS) capped CRGC and CRSC. Solid lines are spectra from MPS capped CRGC and CRSC aggregated with $(NH_4)_2SO_4$ and with naphthalene added to give a final concentration of 10^{-3} M. Clearly, the spectra with naphthalene are identical to the blank spectra showing only MPS bands.

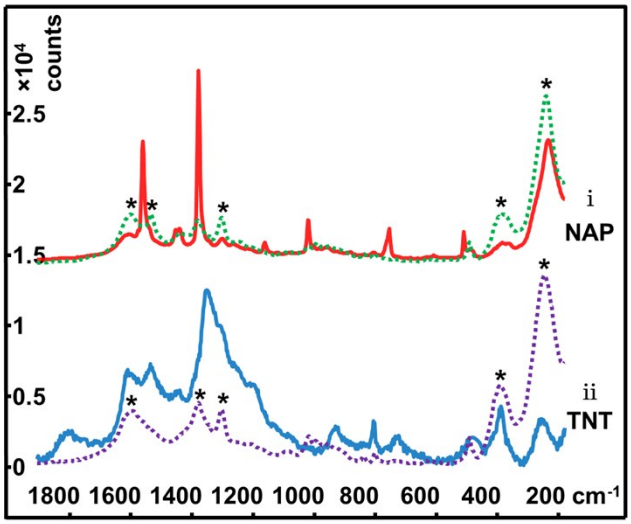

Figure S6. SERS signals of naphthalene (i) at a final concentration of 10^{-5} M and trinitrotoluene (ii) at a final concentration of 5.7×10^{-5}M obtained using aggregated CRGC. The dotted spectra correspond to the SERS signals of aggregated CRGC mixed with blank ethanol solution (i) and DDI water (ii). All spectra were averaged from 10 independent measurements.

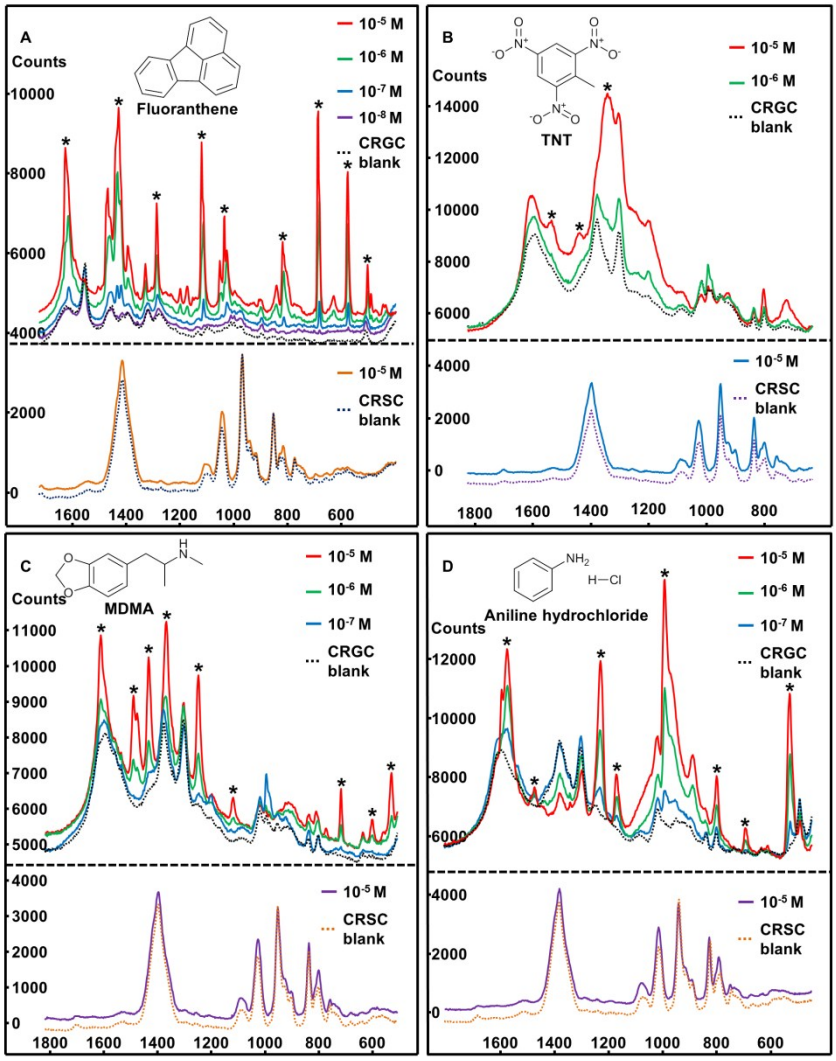

Figure S7. SERS spectra of fluoranthene (A), TNT (B), MDMA (C) and aniline hydrochloride (D) obtained at various concentrations using CRGC and CRSC. The dotted spectra show blank spectra of the colloids.