Supplementary Information

for

Interfacial effect of dual ultra-thin SiO2 core-triple shell Au@SiO2@Ag@SiO2 for ultra-sensitive Trinitrotoluene (TNT) detection

Bingxin Lu,[a] Qi Qi,[a] Yang Wang,[b] Huaiqiu Chang,[c] Jin Zhai*[a] and Tingting You*[a]

[a]Key Laboratory of Bio-Inspired Smart Interfacial Science and Technology of Ministry of Education, School of Chemistry, Beihang University

[b]Institute of Chemistry Chinese Academy of Sciences

[c]National Center for Nanoscience and Technology

* For correspondence: zhaijin@buaa.edu.cn (J Zhai); youtt@buaa.edu.cn

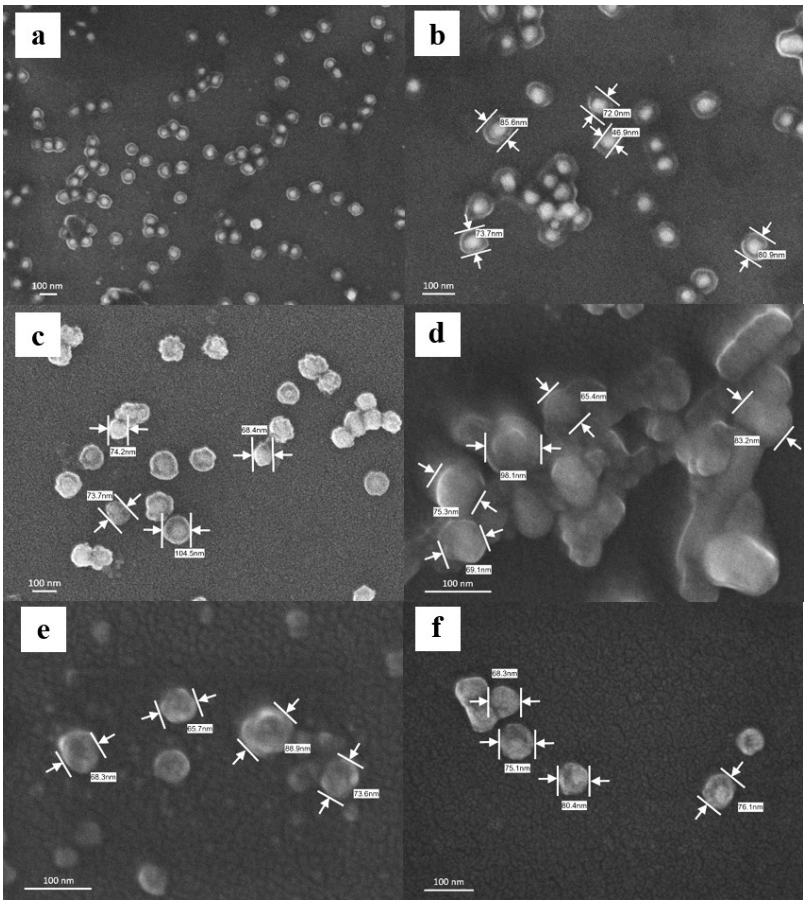

Figure S1. Scanning electron microscopy (SEM) images of (a, b) $Au@SiO_2@Ag@SiO_2$, (c)$Au@Ag@SiO_2$, (d) Au@Ag, (e)$Ag@SiO_2$, and (f) $Au@SiO_2@Ag$.

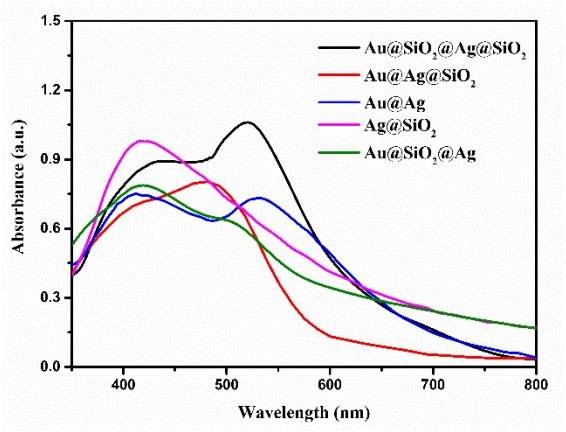

Figure S2. The UV−vis−NIR spectra of the $Au@SiO_2@Ag@SiO_2$, $Au@Ag@SiO_2$, Au@Ag, $Ag@SiO_2$, and $Au@SiO_2@Ag$ NPs, respectively.

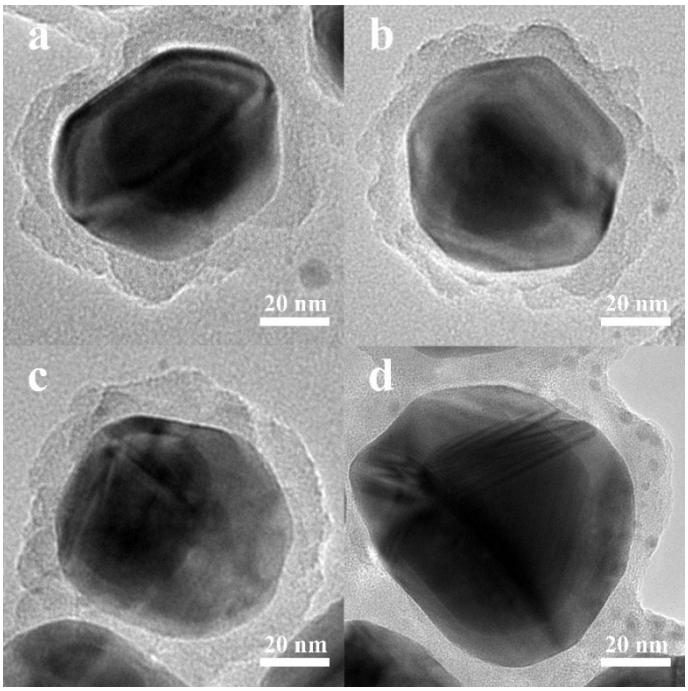

Figure S3. Transmission electron microscopy (TEM) images of the $Au@SiO_2@Ag@SiO_2$ with 3.0 mL(a), 3.1 mL(b), 3.2 mL(c), 3.3 mL(d) of sodium silicate in experiment procedure.

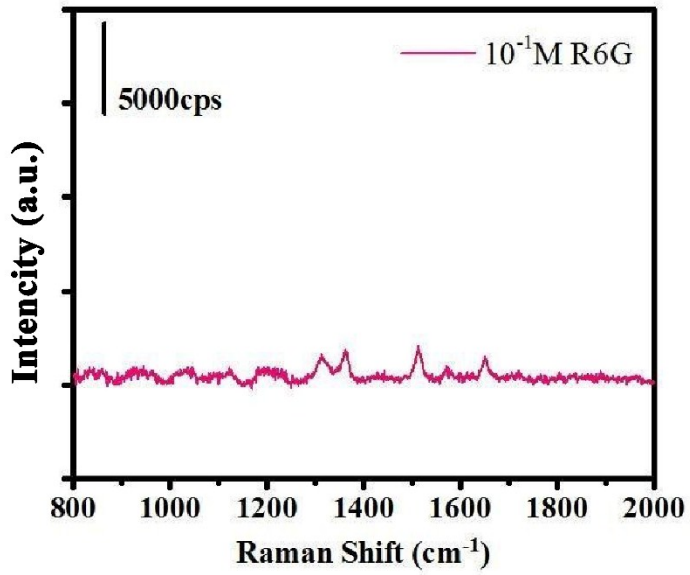

Figure S4. Raman spectra of 10^{-1} M R6G adsorbed on silicon wafer under non-SERS conditions

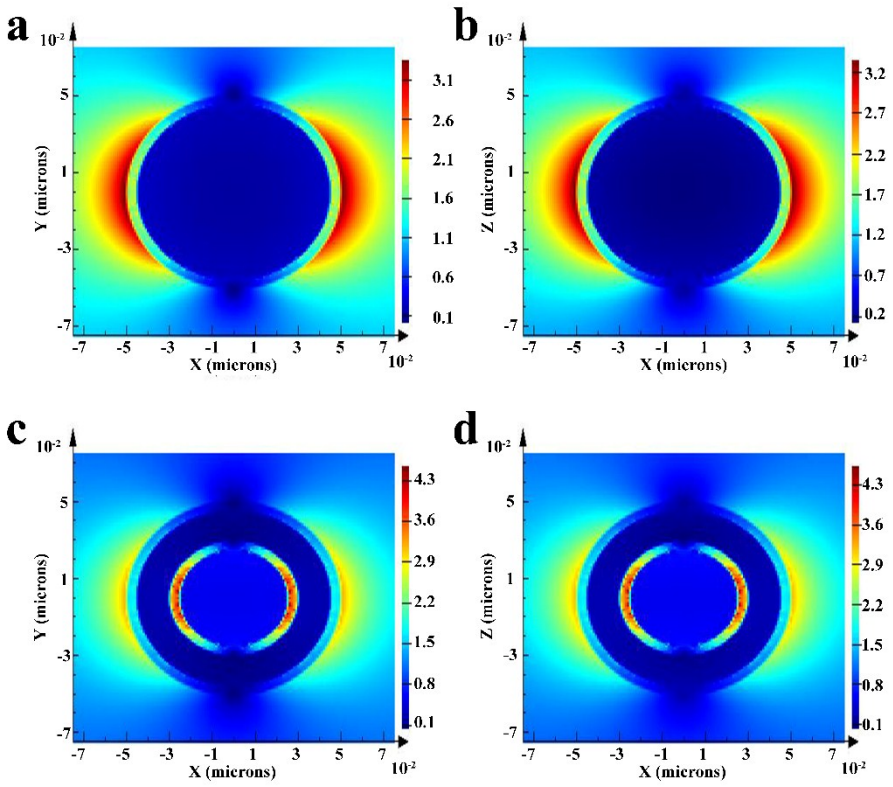

Figure S5. 2D patterns of E-field amplitude (|E|) of $Ag@SiO_2$ model (a, b) and $Au@SiO_2@Ag@SiO_2$ model (c, d). The maximum E-field amplitude (|E|) for $Au@SiO_2@Ag@SiO_2$ model and $Ag@SiO_2$ model is 4.6 and 3.4, respectively.

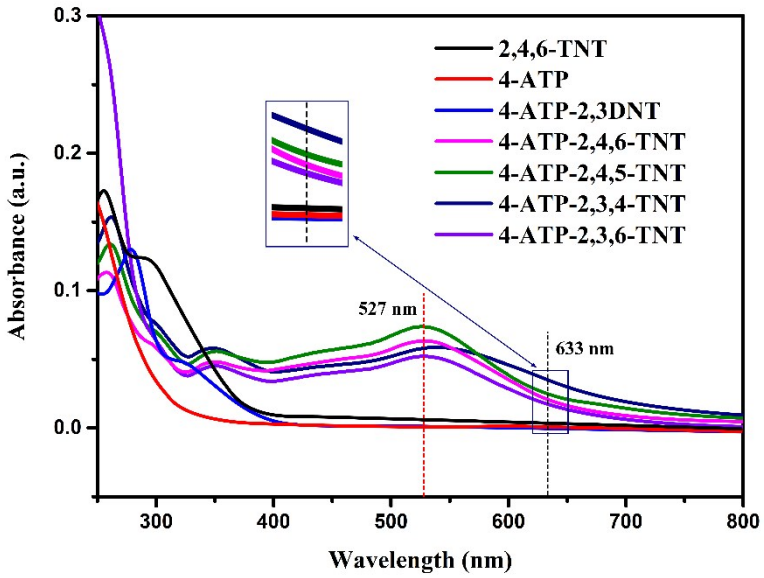

Figure S6. UV-vis absorption spectra of the 2,4,6-TNT, 4-ATP, DNT and 4-ATP complex, TNT and 4-ATP complex, 2,4,6-TNT and 4-ATP complex, 2,4,5-TNT and 4-ATP complex, 2,3,6-TNT and 4-ATP complex,2,3,4-TNT and 4-ATP complex, respectively.

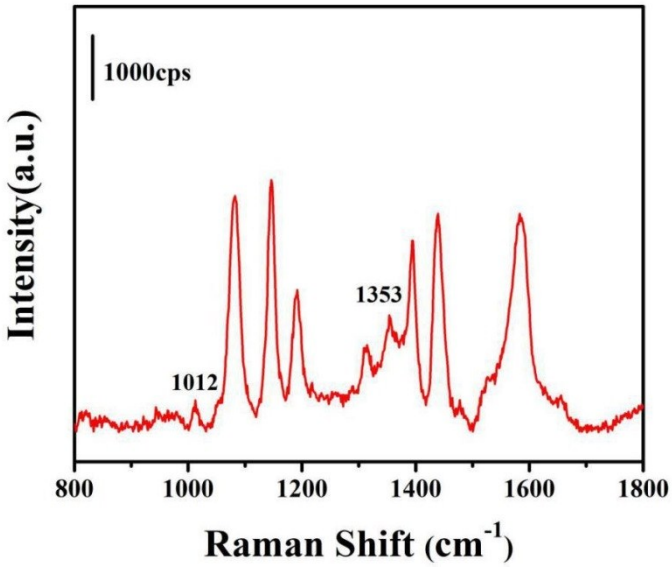

Figure S7. SERS spectra of 10^{-12} M NB(Nitrobenzene) adsorbed on 4-ATP functionalized Au@SiO_2@Ag@SiO_2 substrates.