Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.

Supporting Information for: **Direct observation of enhanced plasmon-driven catalytic activity of Au nanoparticles supported on reduced graphene oxides by SERS**

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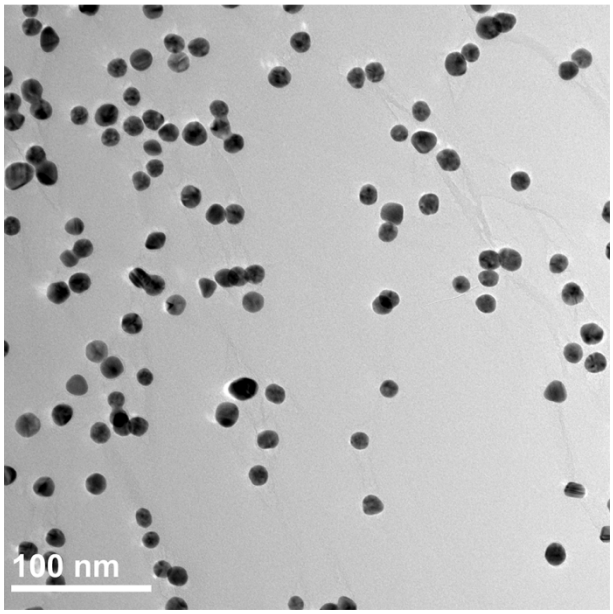

Fig.S1 TEM image of Au/rGO nanocomposite.

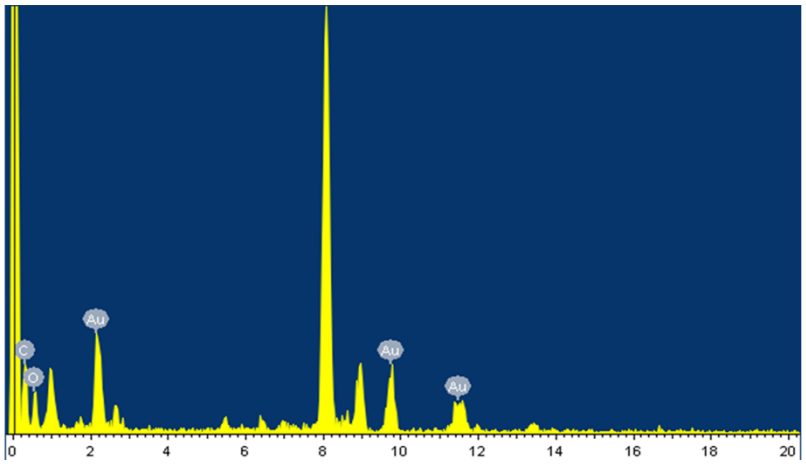

Fig.S2 EDX spectrum of Au/rGO nanocomposites.

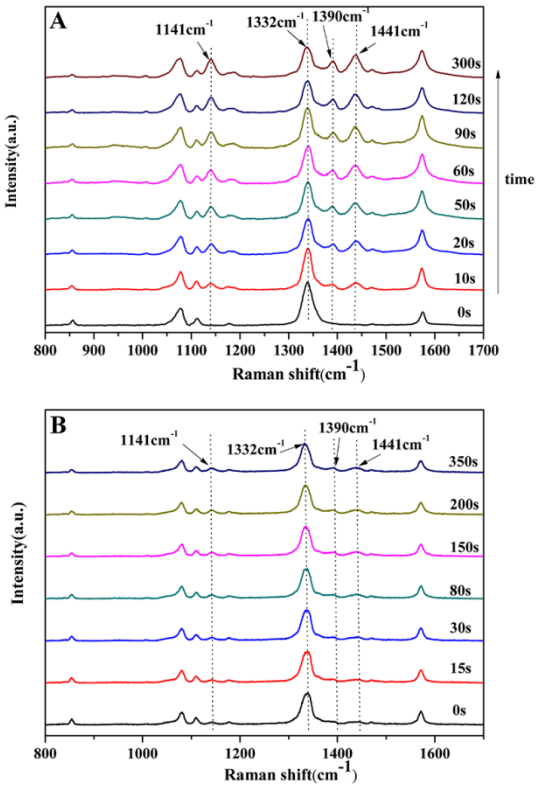

Fig.S3 Time-dependent SERS Spectrum acquired for Au/rGO (A) and Au NPs (B) functionalized with 4-NBT employing 1.2 mW as the laser irradiation power. The spectra were recorded under 647nmexcitation.

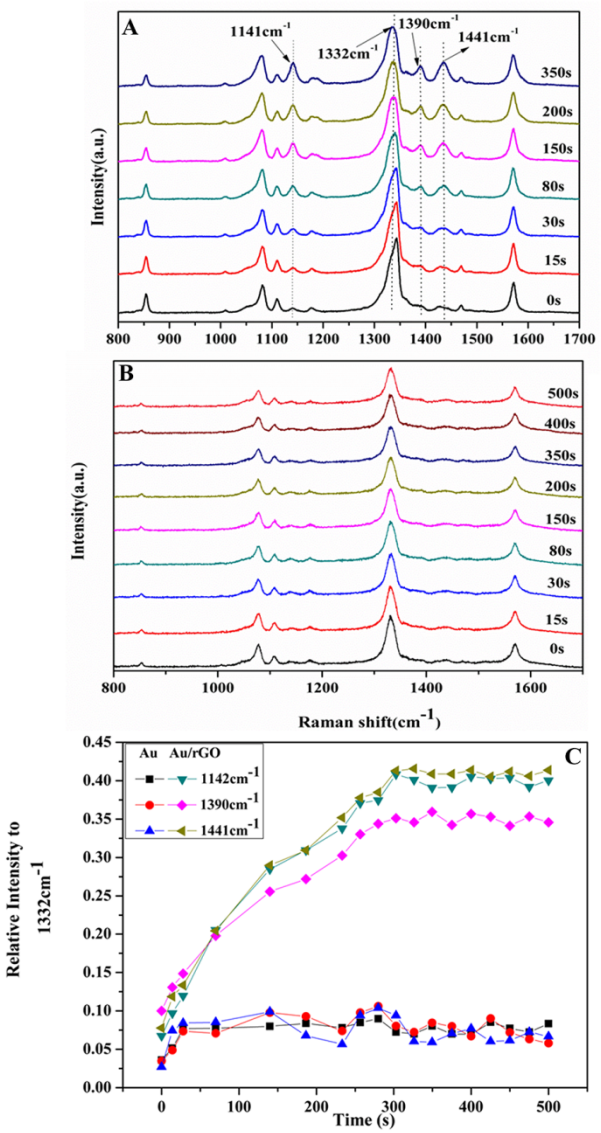

Fig.S4 Time-dependent SERS Spectrum acquired for Au/rGO (A) and Au NPs (B) functionalized with 4-NBT employing 0.4 mW as the laser irradiation power. The spectra were recorded under 647nmexcitation. (C) Coresponding relative Raman intensity of bands at 1141, 1390 and 1441 cm^{-1} to 1332cm^{-1} under excitation with a laser power of 0.4 mW on Au/rGO and Au NPs.

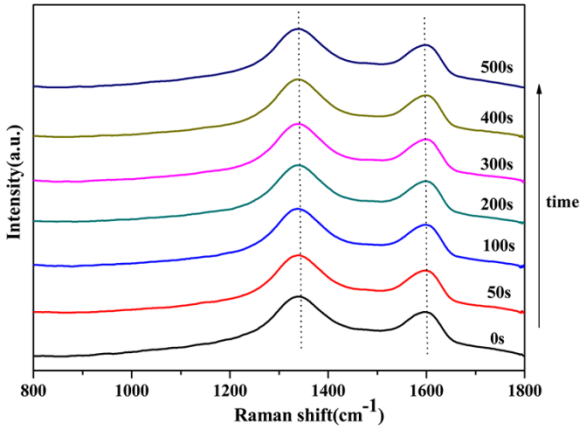

Fig.S5 Time-dependent SERS Spectrum acquired for GO functionalized with 4-NBT employing 4mW as the laser irradiation power. The spectra were recorded under 647 nm excitation..