Supporting Information:

In situ controllable growth of noble metal nanodot on graphene sheet

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(4 pages, 7 figures)

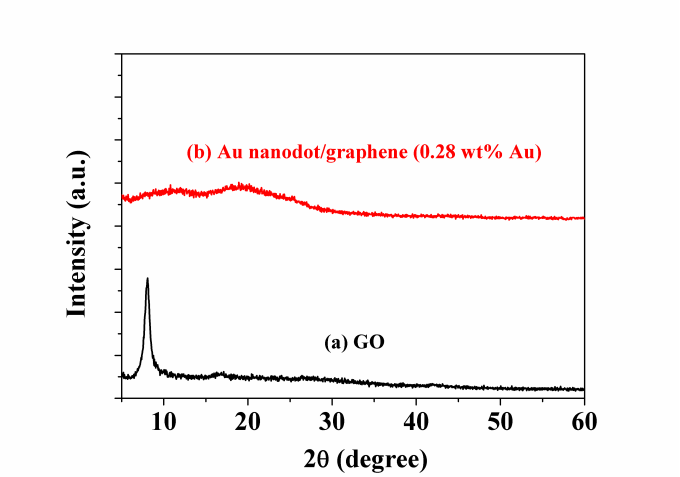

Fig. S1 XRD patterns of (a) GO and (b) Au nanodot/graphene (0.28 wt% Au) composites.

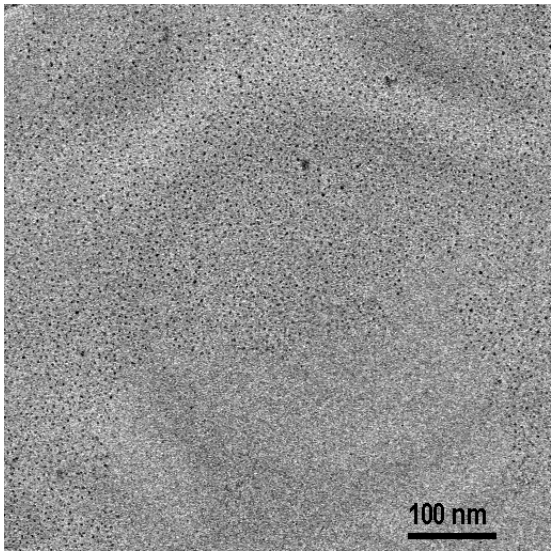

Fig. S2 TEM images of different regions of the morphologies of Au nanodot in situ growth on graphene sheet (0.28 wt% Au).

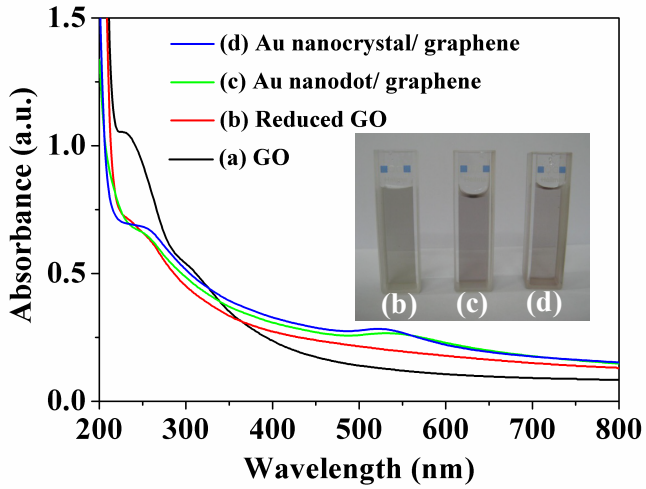

Fig. S3 UV-vis spectra of (a) GO, (b) reduced GO, (c) Au nanodot/graphene composites (0.28 wt% Au) prepared by 0.03 mM $HAuCl_4$ with sonolytic process, and (d) Au nanocrystal/graphene composites prepared by 0.03 mM $HAuCl_4$ without sonolytic process.

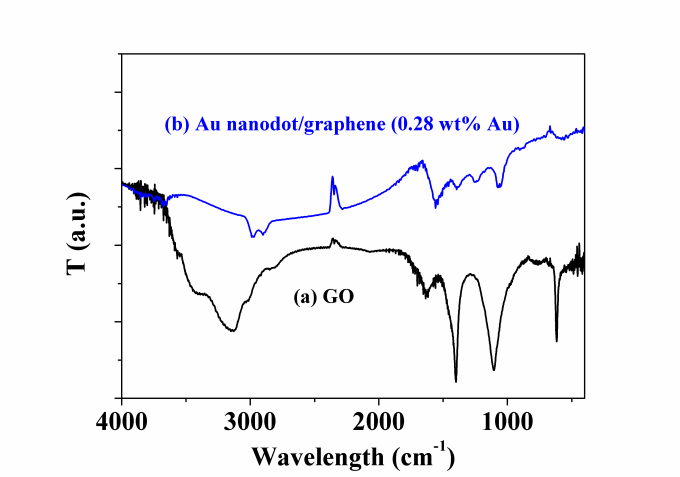

Fig. S4 Fourier transform infrared (FTIR) spectra of (a) GO and (b) Au nanodot/graphene (0.28 wt% Au) composites.

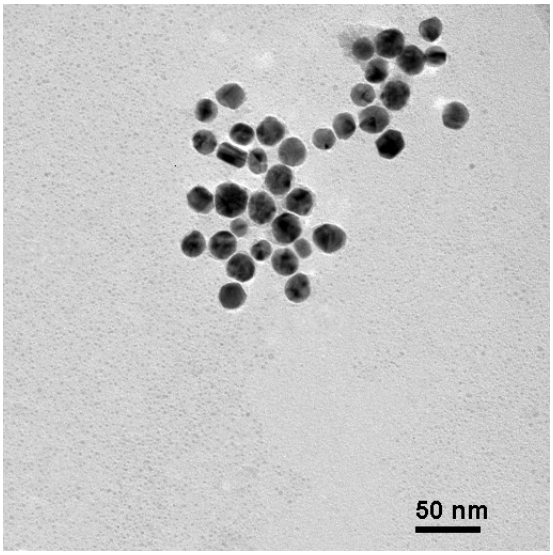

Fig. S5 TEM images of Au nanodot/graphene composites. The concentration of $HAuCl_4$ in the initial solution was 0.1 mM. Au nanodot with a size of 2.3 nm was observed on the graphene sheet as well as a much bigger sized Au nanocrystal (15.70 nm).

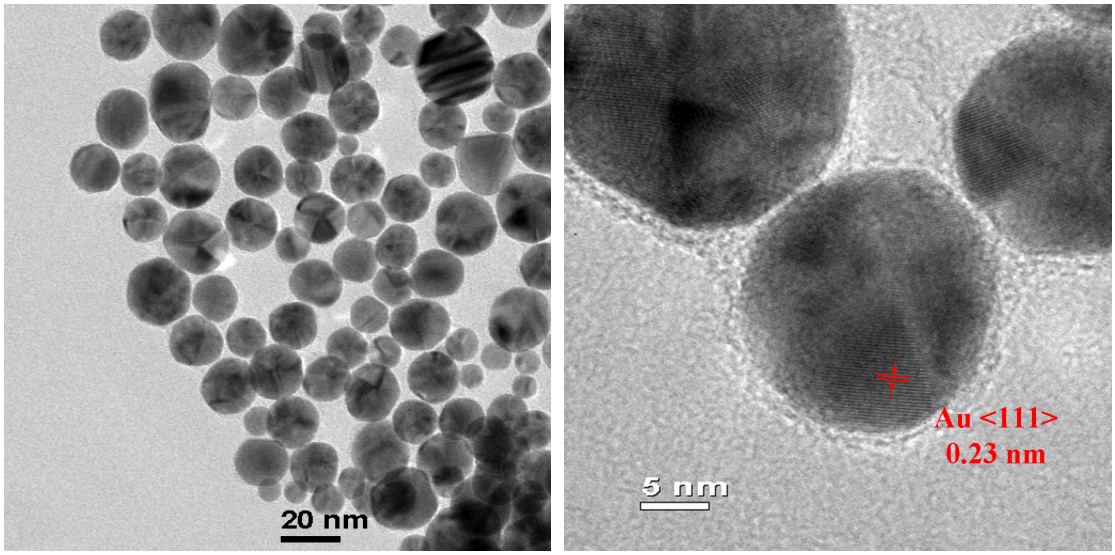

Fig. S6 TEM images of Au nanocrystal/graphene composites (Au nanocrystal size: 18.8 nm) synthesized by hydrothermal method without sonolytic treatment. The concentration of $HAuCl_4$ in the initial solution was 0.1 mM. High resolution TEM images of Au nanocrystal show a lattice fringe of 2.3Å, corresponding to Au <111> planes.

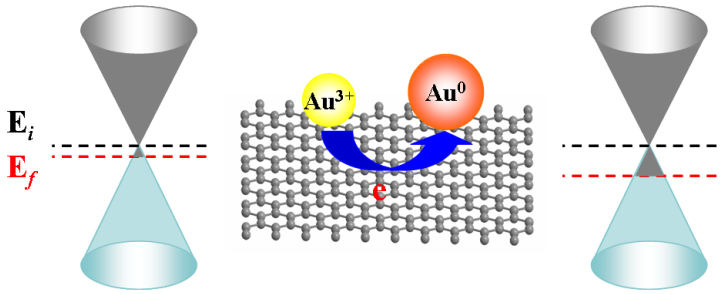

Fig. S7 Modulation of electronic structure by Au^{3+} during sonolytic process.