Supplementary materials

Functionalized Graphene/Fe$_3$O$_4$ Supported AuPt alloy as a Magnetic, Stable and Recyclable Catalyst for Catalytic Reduction Reaction

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Fig. S1 SEM image of the nanocarrier of BGNs/Fe$_3$O$_4$ at different magnifications.
Fig. S2 XRD spectra of Au$_{0.3}$Pt$_{0.7}$ alloy nanoparticles.
Fig. S3 The zeta potential values of (a) BGNs/Fe$_3$O$_4$, (b) Au$_{0.3}$Pt$_{0.7}$ alloy nanoparticles and (c) the multifunctional nanocatalyst of Au$_{0.3}$Pt$_{0.7}$@BGNs/Fe$_3$O$_4$. 
Fig. S4 The EDX spectrum of Au_{0.3}Pt_{0.7}@BGNs/Fe_3O_4.
Fig. S5 Magnetization curves of the support materials of BGNs/Fe$_3$O$_4$. 
Fig. S6 Plots of $\ln(C/C_0)$ against reaction time for the reduction of 4-NP only with Fe$_3$O$_4$ nanoparticles.
Fig. S7 TEM images of different composites of AuPt alloy nanoparticles (a:Au_{0.8}Pt_{0.2}, c:Au_{0.7}Pt_{0.3}, e:Au_{0.3}Pt_{0.7}, g:Au_{0.3}Pt_{0.7} and i:Au_{0.2}Pt_{0.8}) and different composites of AuPt alloy nanoparticles were assembled on the surface of BGNs/Fe_{3}O_{4} (b:Au_{0.8}Pt_{0.2}@BGNs/Fe_{3}O_{4}, d:Au_{0.7}Pt_{0.3}@BGNs/Fe_{3}O_{4}, f:Au_{0.3}Pt_{0.7}@BGNs/Fe_{3}O_{4}, h:Au_{0.3}Pt_{0.7}@BGNs/Fe_{3}O_{4} and i:Au_{0.2}Pt_{0.8}@BGNs/Fe_{3}O_{4}).