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SUPPORTING INFORMATION

Reduced graphene oxide supported Ag_xNi_{100-x} alloy nanoparticles: A highly active and reusable catalyst for the reduction of nitroarenes

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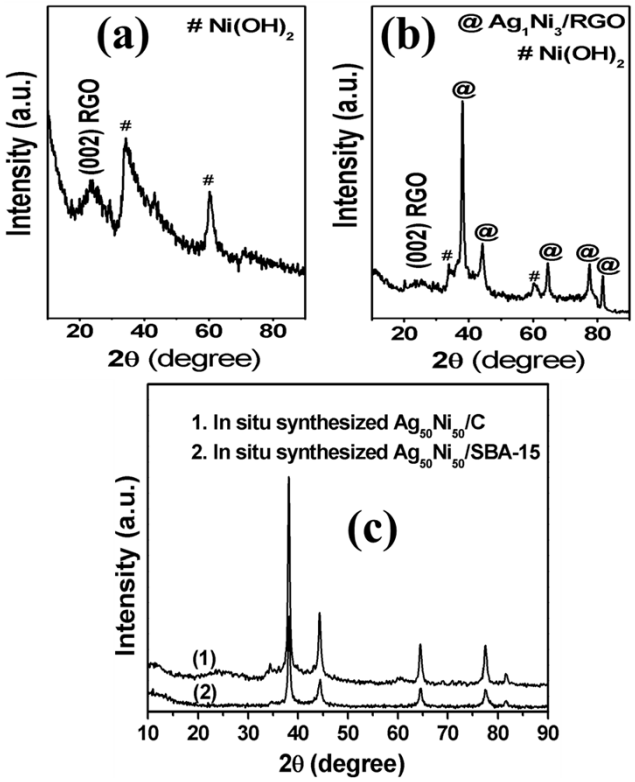

Figure S1. XRD spectrum of (a) pure Ni/RGO, (b) $Ag_{25}Ni_{75}$/RGO, (c) insitu $Ag_{50}Ni_{50}$/C and insitu $Ag_{50}Ni_{50}$/SBA-15 nanocomposite samples.

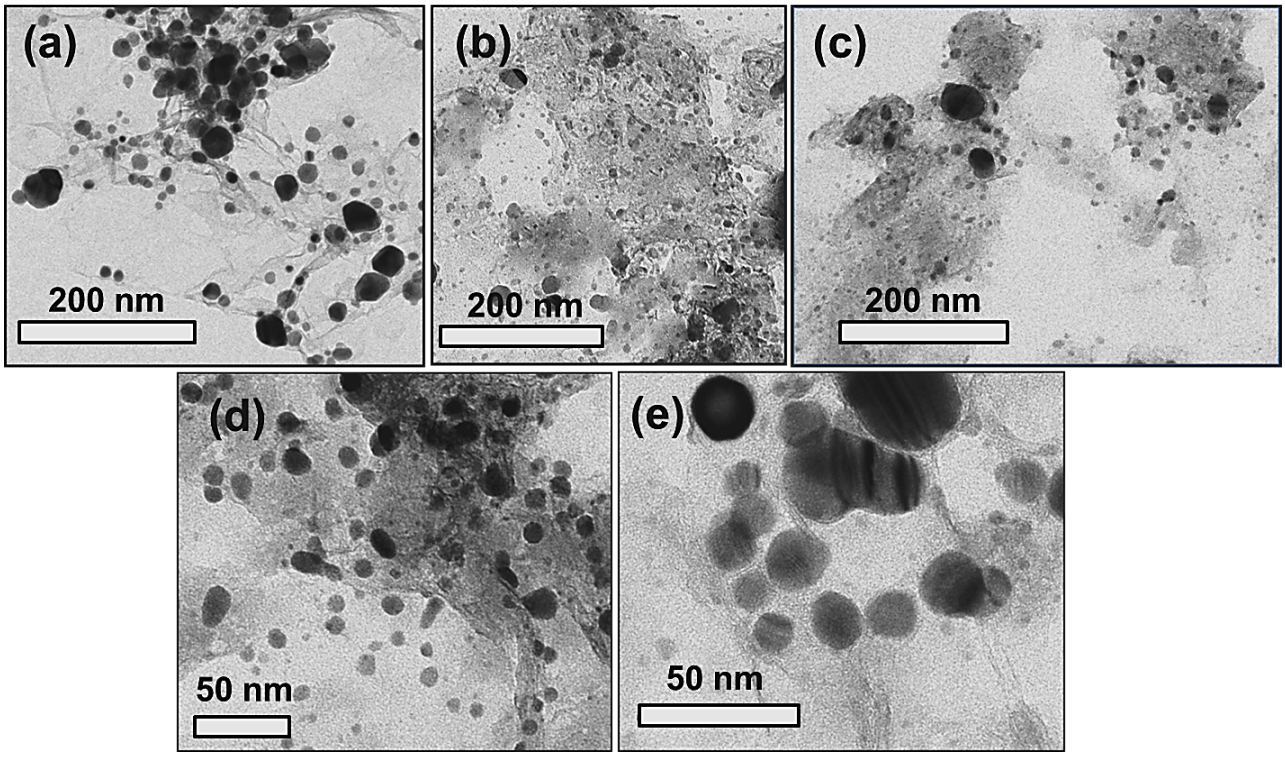

Figure S2. Low resolution TEM images for (a) Ag/RGO, (b) $Ag_{75}Ni_{25}$/RGO, (c,d) $Ag_{50}Ni_{50}$/RGO and (e) $Ag_{25}Ni_{75}$/RGO samples.

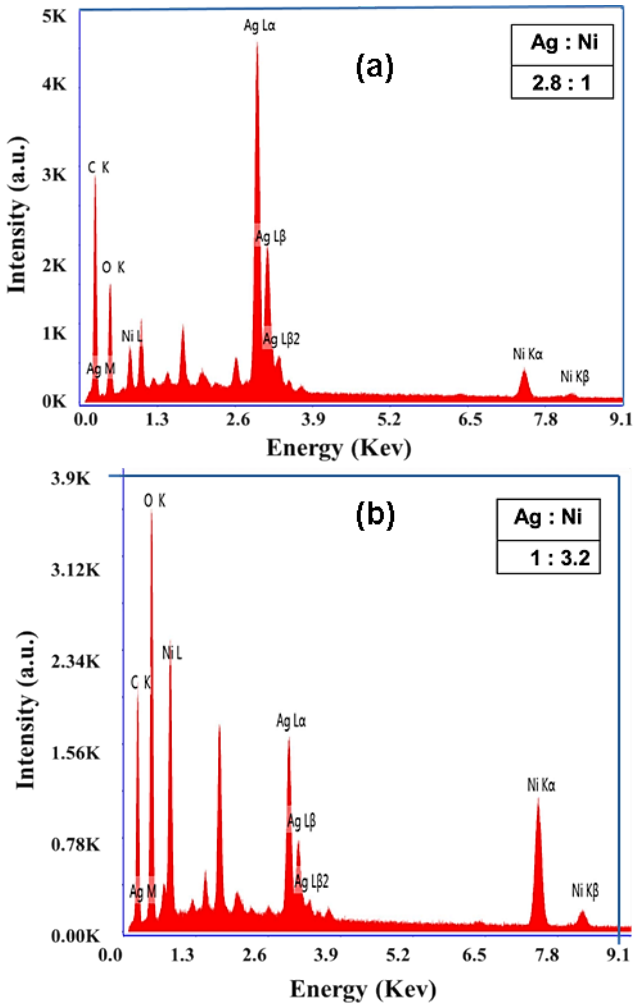

Figure S3. EDS analysis of (a) $Ag_{75}Ni_{25}$/RGO, (b) $Ag_{25}Ni_{75}$/RGO samples.

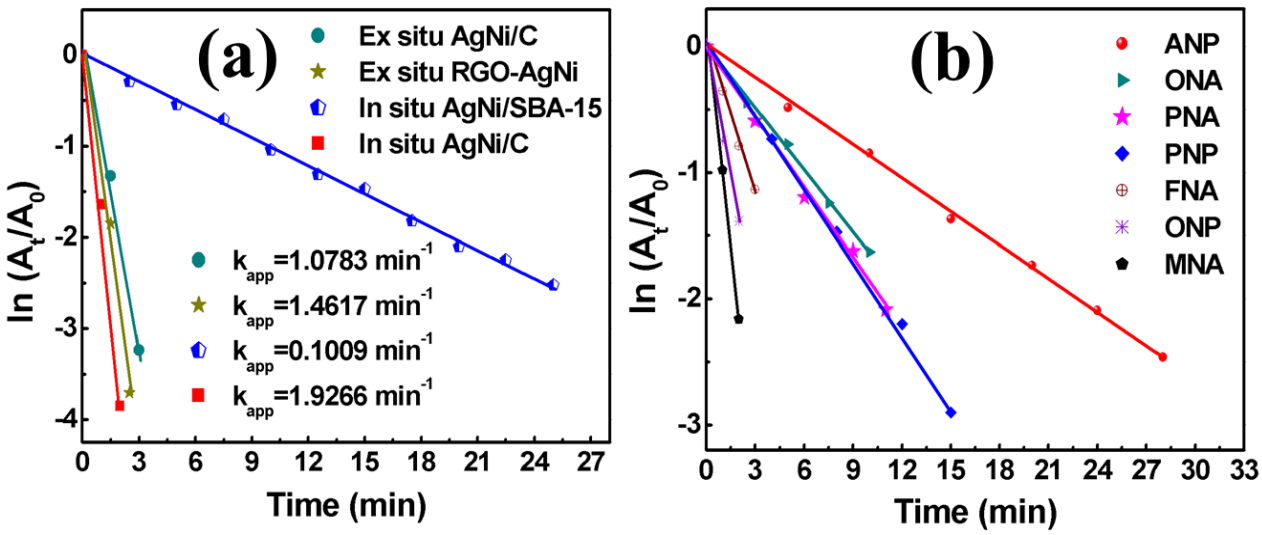

Figure S4. Plots of $\ln(A_t/A_0)$ versus time for rate constant calculation of (a) insitu AgNi/C, exsitu AgNi/RGO, exsitu AgNi/C, insitu AgNi/SBA-15 nanocomposite samples (b) tandem reduction reactions of nitro compounds with AB using highest active insitu synthesized $Ag_{50}Ni_{50}$/RGO nanocomposites.

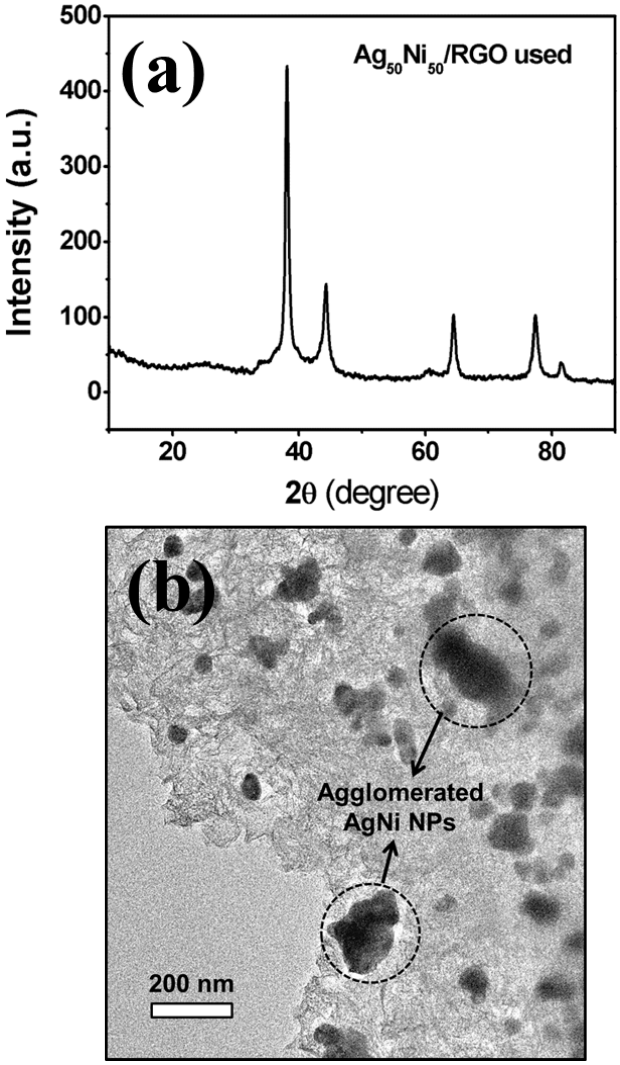

Figure S5. (a) XRD spectrum and (b) low resolution TEM image of $Ag_{50}Ni_{50}$/RGO sample after four cycle.

Table 1. Comparison of apparent rate constant and activity parameter of some recent nano-catalysts with present work for reduction of 4-NP by $NaBH_4$.

Catalyst	Type	Amount of Catalyst (mg)	Apparent rate Constant $K_{app}= \times 10^{-3}\ s^{-1}$	Activity Parameter $K= s^{-1}g^{-1}$	Reference
Ni/Ag	Core-shell	0.5	2.16	4.33	19
$Ag_{0.6}Ni_{0.4}$	MTNPs	0.2	32.2	161	29
RGO-$Ni_{25}Co_{75}$	Nanocomposite	6	93.22	15.53	34
RGO-$ZnNi_5$-2	Nanocomposite	5	3.92	0.785	37
Pd-Ag	Dendrites	1	39.1	39.1	38
$Au_{0.1}Ag_{0.9}$	Nanowire	0.25	3.8	15.2	39
Au-Fe_3O_4	Supported	2	6.33	3.165	40
Fe3O4@SiO2-LBL-Au	Composite microsphere	0.03	56.6	188.8	41
$Pt_{55}Pd_{38}Bi_7$	Nanowires	0.015	4.3	286.6	42
$Pt_{50}Au_{50}/CeO_2$	Nanotube	50	108.7	2.174	43
Ag50Ni50/RGO	Nanocomposite	0.02	48.40	968	Present work