# Palladium nanoparticles immobilized on core-shell magnetic fibrous as highly efficient and recyclable heterogeneous catalyst for reduction of 4-nitrophenol and Suzuki coupling reactions

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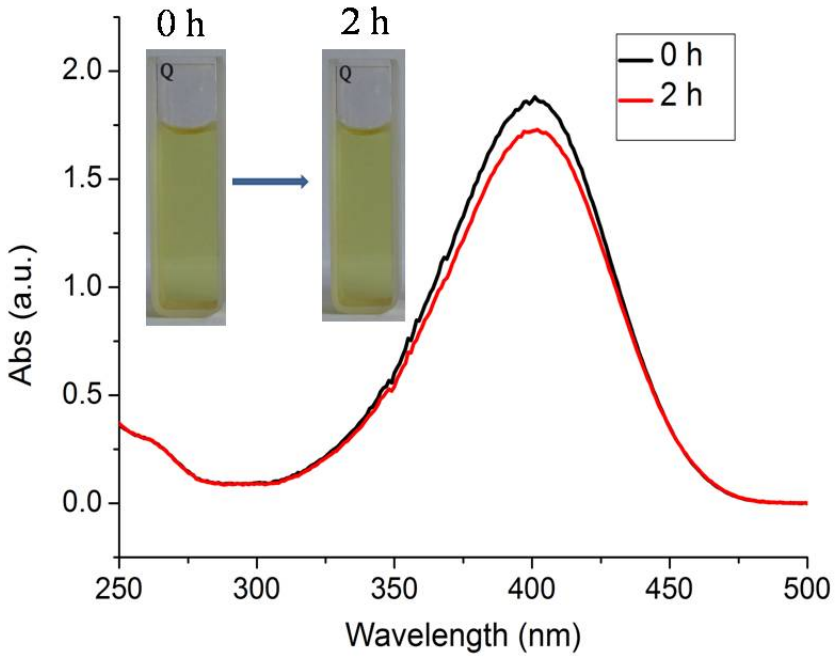
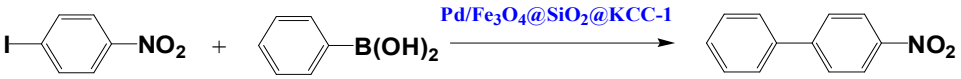



**Fig. S1** UV-Vis spectra of 4-NP/$NaBH_4$ solution when adding $Fe_3O_4$@$SiO_2$@KCC-1 as catalyst at the reaction time of about 0 h and 2 h, inset image the colour change of the 4-NP/$NaBH_4$/ $Fe_3O_4$@$SiO_2$@KCC-1 mixture at the reaction time of about 0 h and 2 h.

**Table 1**

The control reactions of $Fe_3O_4$@$SiO_2$@KCC-1 and Pd/$Fe_3O_4$@$SiO_2$@ KCC-1 catalyst in the cross coupling reaction between 1-Iodo-4-nitrobenzene and phenylboronic acid were carried out.




| Entry | Catalyst | Time (h) | Yield (%) |
|---|---|---|---|
| 1 | $Fe_3O_4$@$SiO_2$@KCC-1 | 3 | -- |
| 2 | Pd/$Fe_3O_4$@$SiO_2$@ KCC-1 | 3 | 97 |

[a] Reaction condition: aryl halide (0.5 mmol), aryl boronic acid (0.75 mmol), base (1.0 mmol), ethanol 5.0 mL, 0.01 g catalyst, in air, 3 h.

[b] Yield was determined by GC analysis.