Supplementary Information

Confinement of Cu nanoparticles in the nanocages of large pore SBA-16 functionalized with carboxylic acid: Enhanced activity and improved durability for 4-nitrophenol reduction

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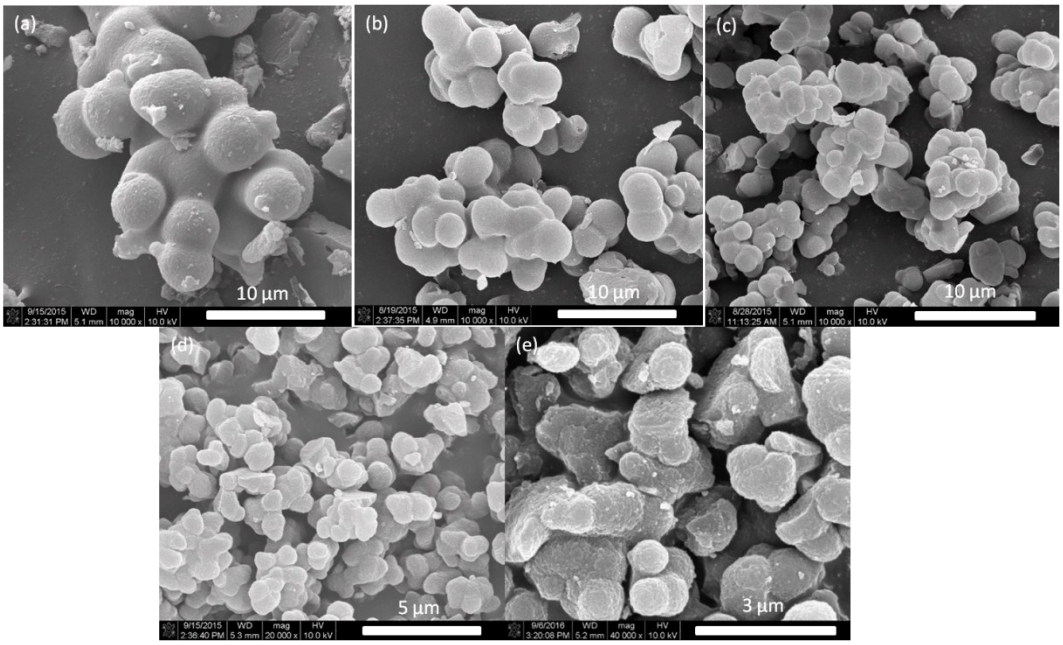

Fig. S1. SEM images of (a) LP-S16C-5, (b) LP-S16C-10, (c) LP-S16C-20, (d) LP-S16C-30, and (e) LP-S16C-40

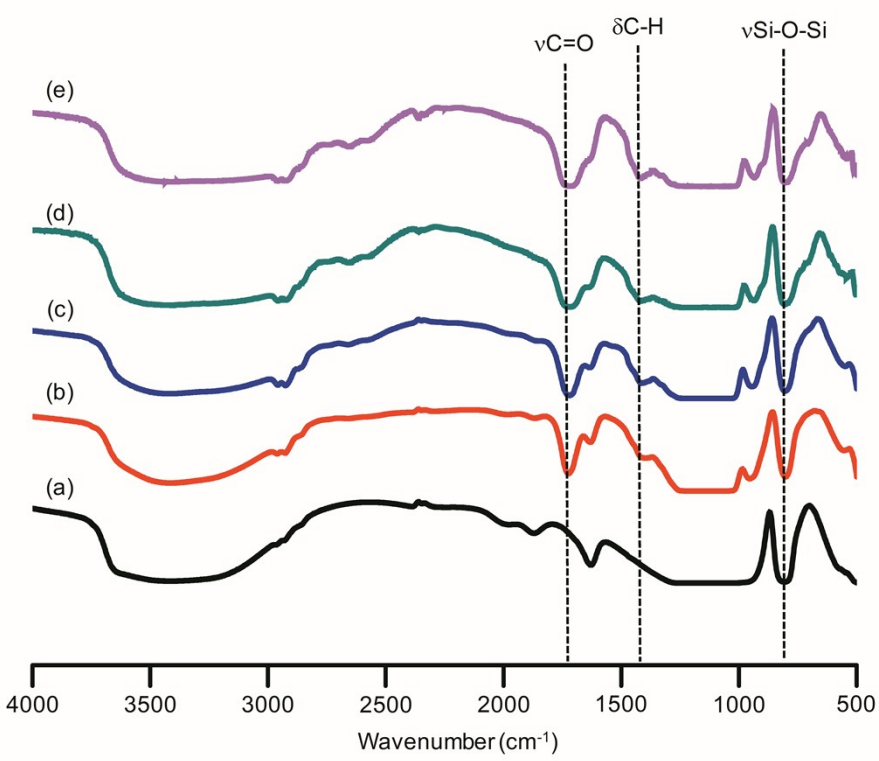

Fig. S2. FTIR spectra of LP-S16C-x, where x = (a) 0, (b) 10, (c) 20, (d) 30, and (e) 40.

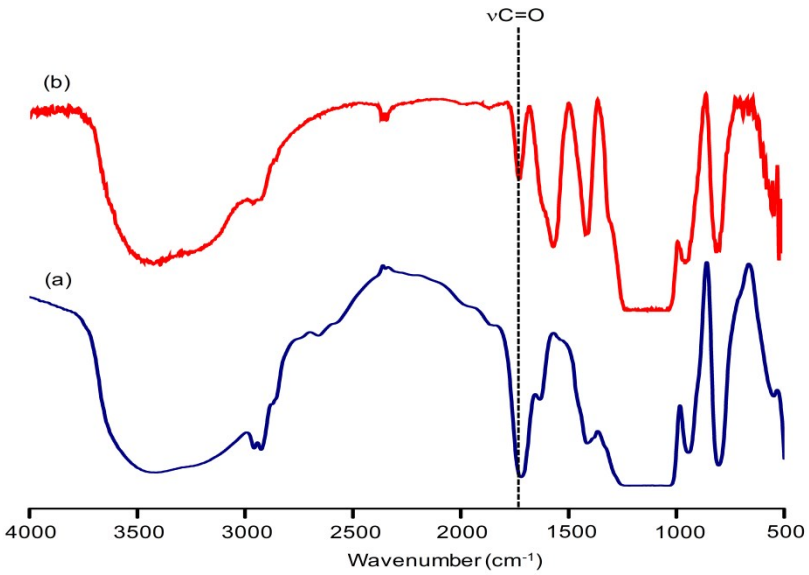

Fig. S3. FTIR spectra of (a) LP-S16C-20 and (b) Cu(5)@LP-S16C-20.

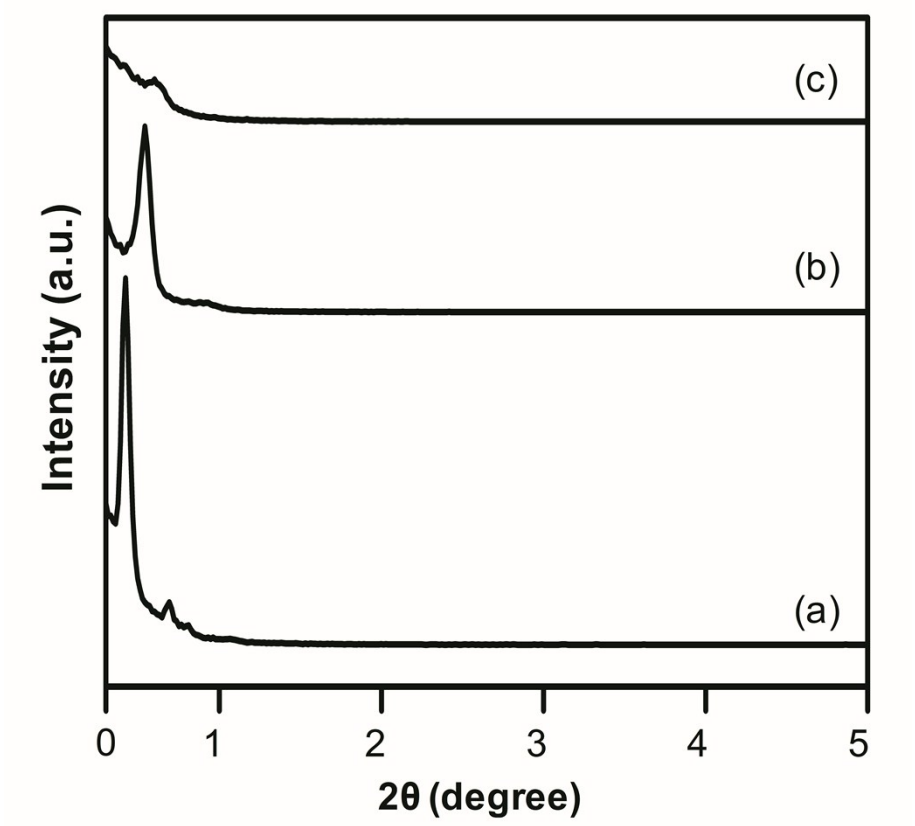

Fig. S4. SXRD patterns of Cu(5)@LP-S16C-x where x = (a) 0, (b) 20 and (c) 40.

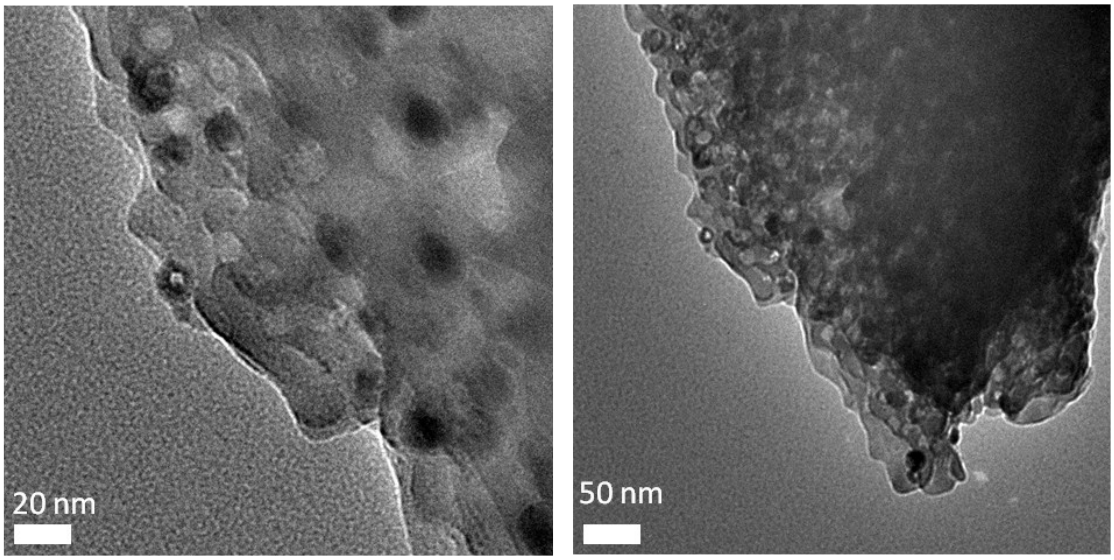

Fig. S5. TEM images of Cu(5)@LP-S16C-40 at different resolutions.

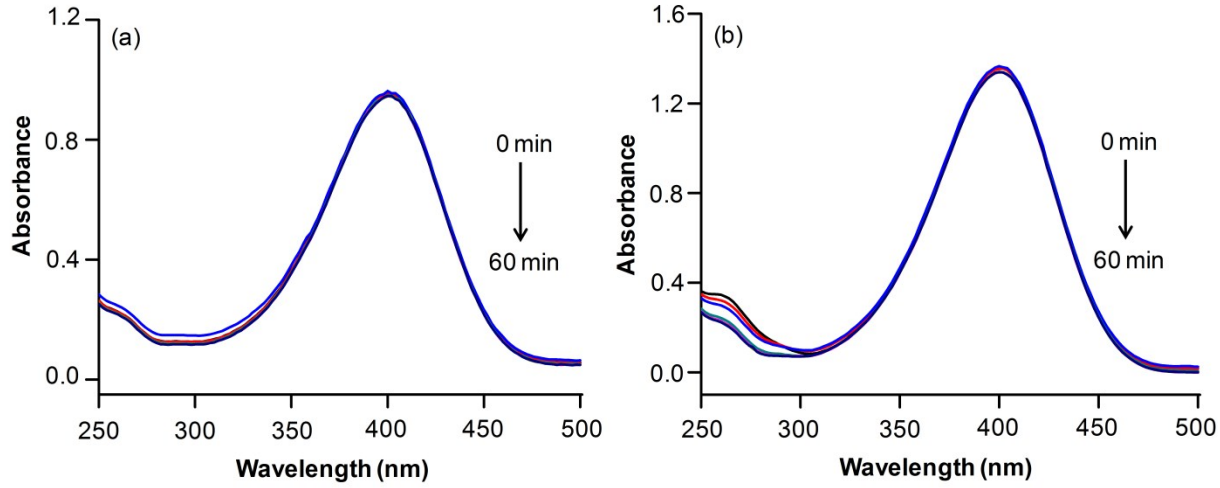

Fig. S6. UV-Vis spectra of (a) reduction of 4-NP to 4-AP by the framework (LP-S16C-20) and (b) background reaction

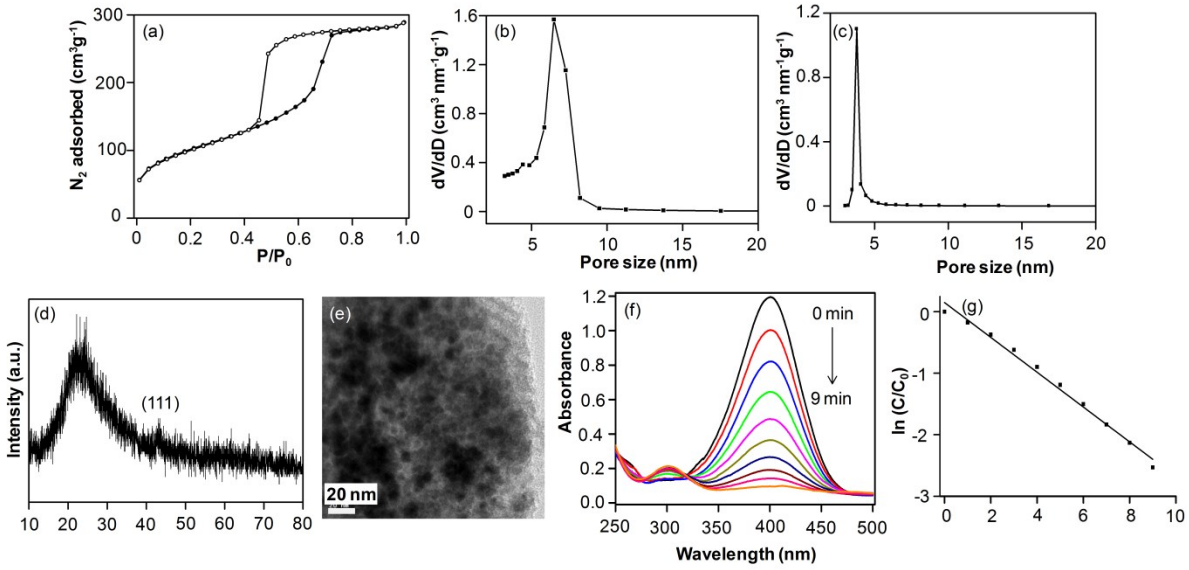

Fig. S7: (a) N_2 adsorption-desorption isotherm, (b) BJH adsorption pore size distribution, (c) BJH desorption pore size distribution, (d) WXRD, (e) HRTEM, (f) UV-vis spectra and (g) corresponding A_t/A_0 plot of Cu(5)@SBA-16.

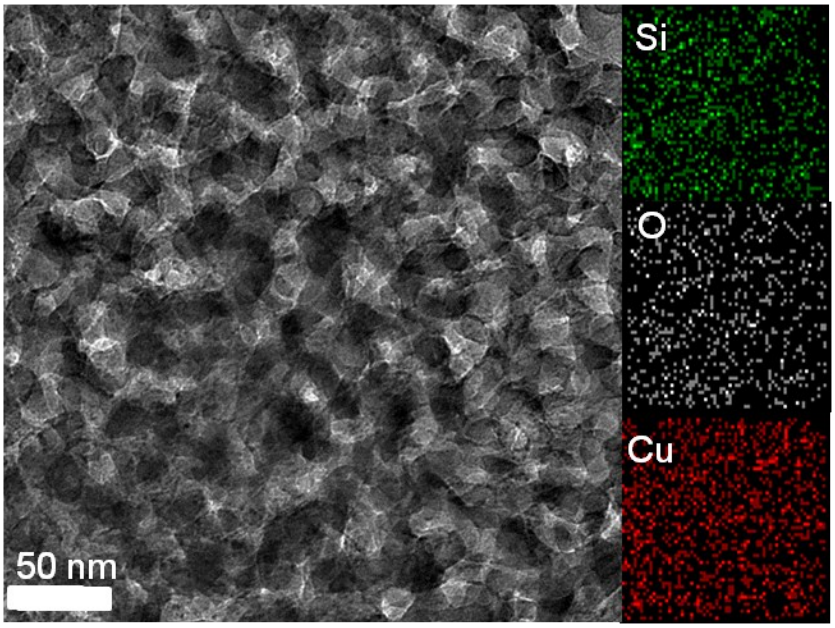

Fig. S8. TEM image and elemental mapping of Cu(5)@LP-S16C-20 after use for 4 times and kept in a freeze dryer.

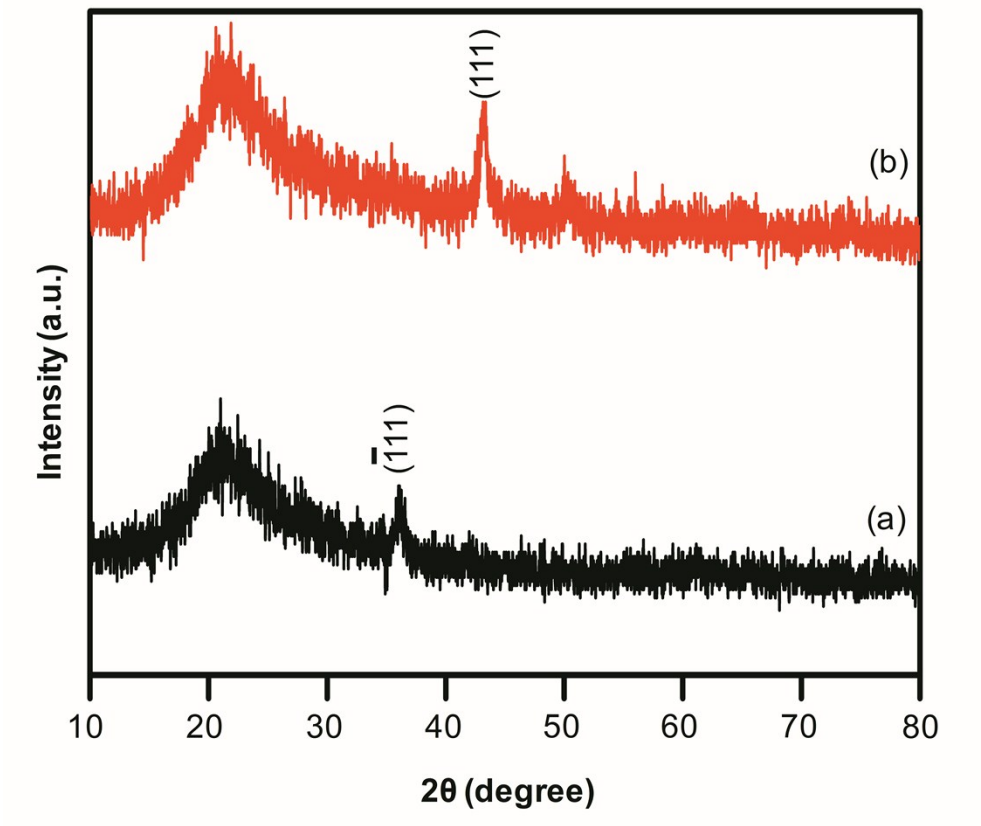

Fig. S9. WXRD patterns of recycled Cu(5)@LP-S16C-20 (a) kept in air and (b) kept in a freeze dryer.

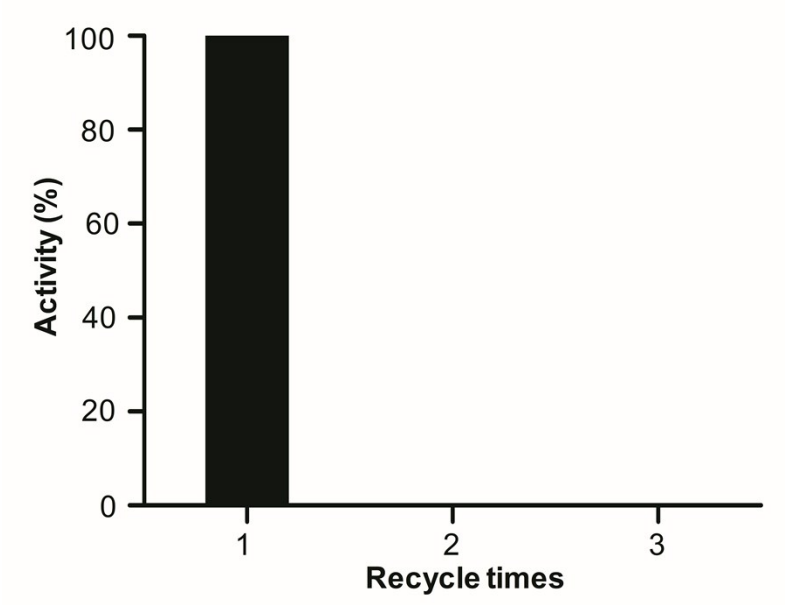

Fig. S10. Activity of Cu(5)@LP-S16C-20 catalyst kept in air.