Electronic Supplementary Material (ESI) for Catalysis Science & Technology.

Confinement of Pt nanoparticles in cage-type mesoporous silica SBA-16 as efficient catalysts for toluene oxidation: The effect of carboxylic groups on the mesopore surface

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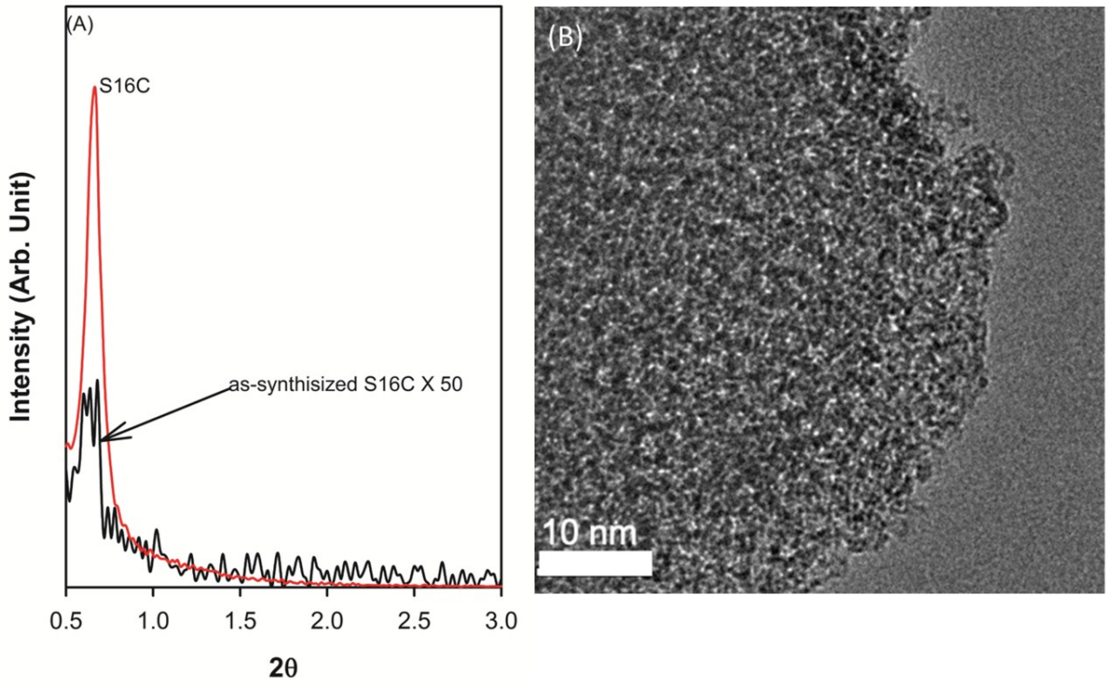

Fig. S1. (A) Small-angle XRD patterns of as-synthesized S16C with and without template removal and (B) TEM image of S16C after template removal

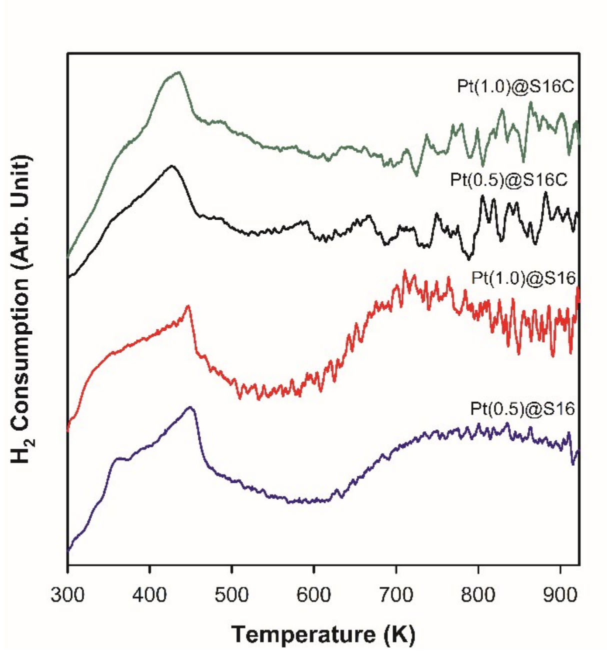

Fig. S2. H_2-TPR profiles of Pt(x)@S16C and Pt(x)@S16 catalysts after calcination in air at 673 K for 5 h, where x = 0.5 and 1.0 wt.%.

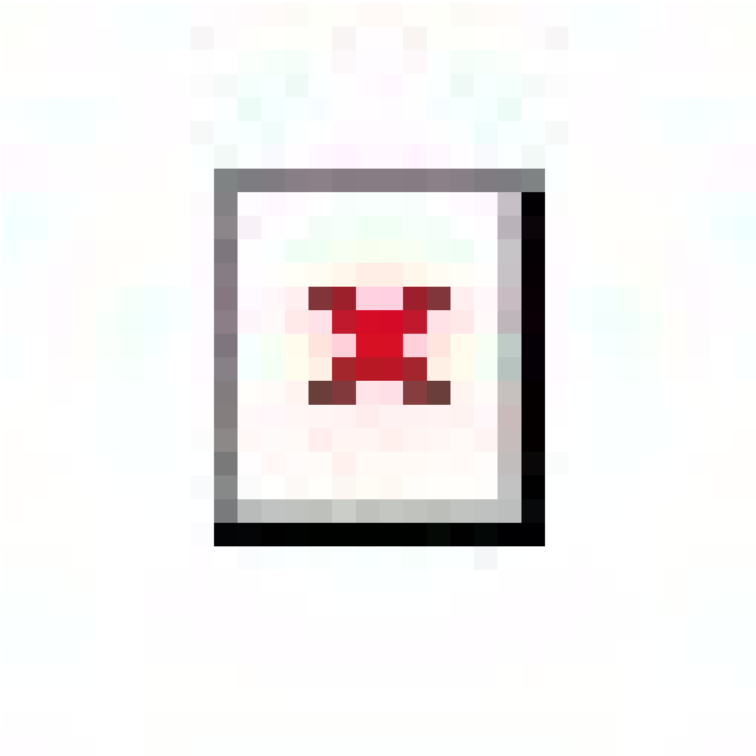

Fig. S3 Zeta potential of S16C and S16 at different pH values.

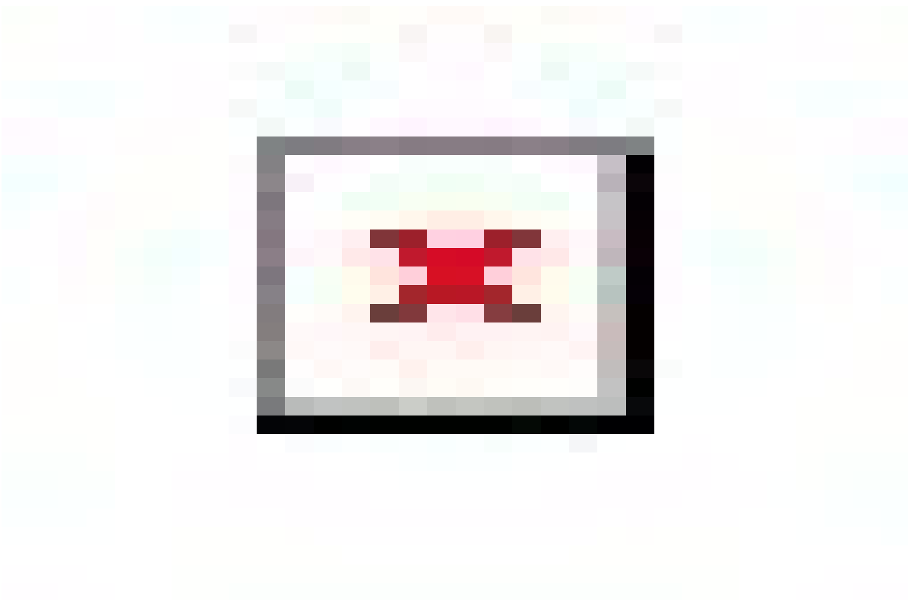

Fig. S4. Thermogravimetric analysis (TGA) and differential thermal analysis (DTA) curves of the 1.0 wt% Pt^{4+} impregnated on S16C and S16C support in an air stream.

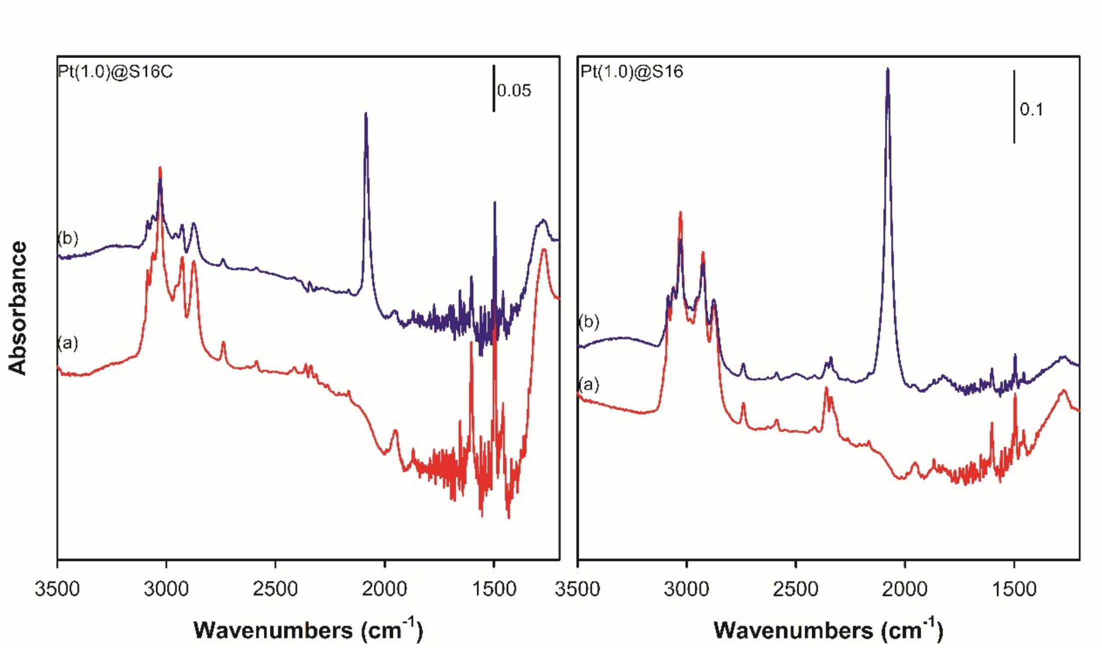

Fig. S5. IR spectra of (a) toluene adsorption and (b) CO adsorption on toluene-precovered Pt(1.0)@S16C and Pt(1.0)@S16 catalysts. The adsorption of toluene was performed by injecting 5 μL of liquid at room temperature.

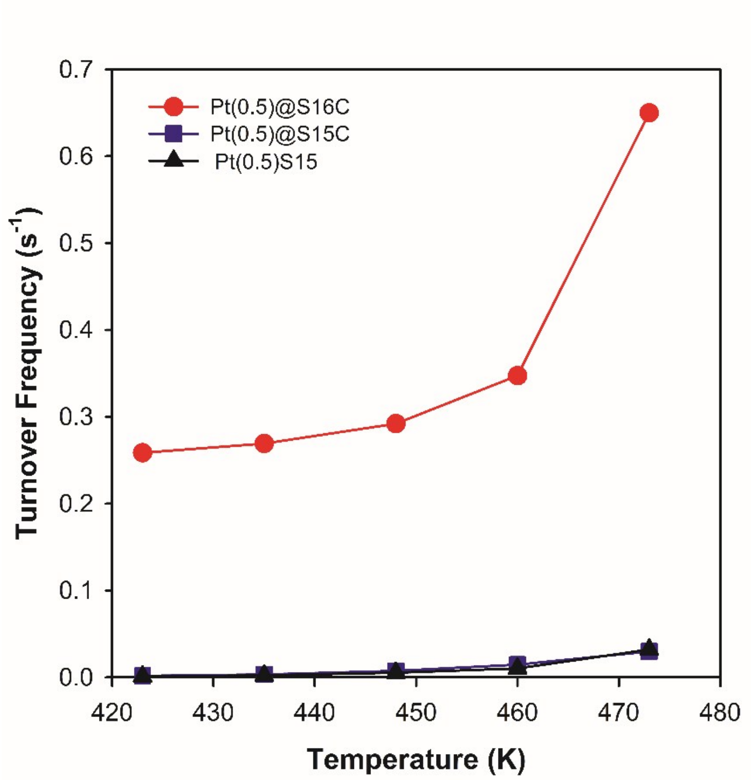

Fig. S6. Comparison of the reaction rates for toluene oxidation for the Pt(0.5)@S16C, Pt(0.5)@S15C and Pt(0.5)@S15 catalysts as a function of temperature.