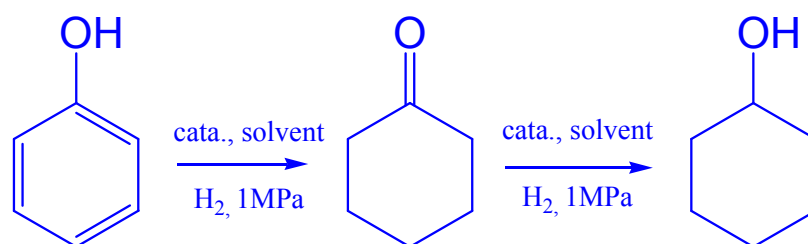


Electronic Supplementary Information (ESI)

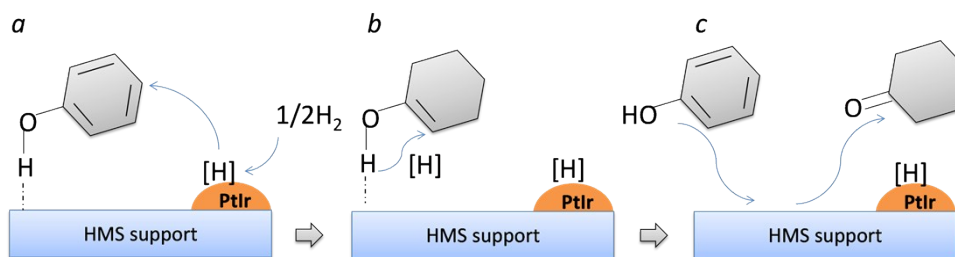
Hollow mesoporous silica supported PtIr bimetal catalysts for selective hydrogenation of phenol: significant promotion effect of Iridium

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1. Figures and schemes



Scheme S1 Reaction pathway of phenol hydrogenation. Firstly, the partial phenol hydrogenation yields cyclohexanone, and then goes through deep hydrogenation to the cyclohexanol.



Scheme S2 Possible Reaction Mechanism of Phenol over PtIr/HMS. Firstly, the phenol is easily absorbed on the surface of the catalyst, and H_2 is dissociated into active hydrogen, denoted as $[H]$, on the surface of PtIr (step a). The phenol is then partially hydrogenated with $[H]$ to form the enol (step b), which can isomerize rapidly to give cyclohexanone [1]. Finally the cyclohexanone leaves the surface of the catalyst, being replaced by new phenol molecule (step c), or proceeds further hydrogenation to cyclohexanol [2] (not shown for brevity).

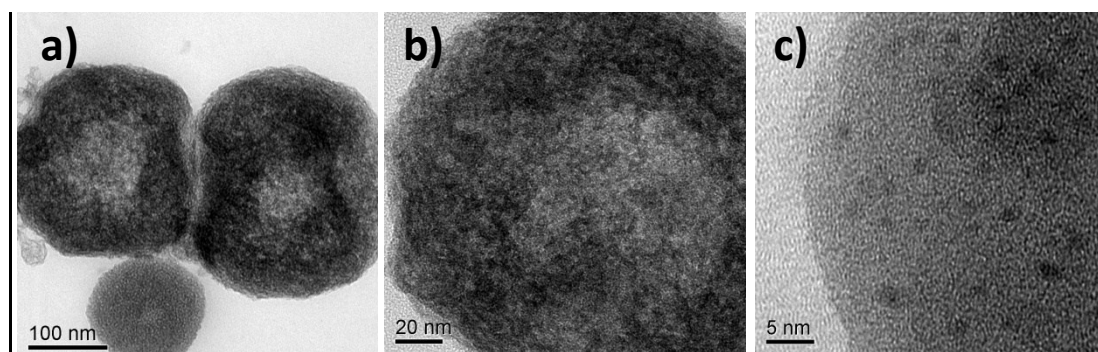


Fig. S1 TEM images of PtIr0.1/HMS after hydrogenation. It showed negligible metal sintering for the PtIr0.1/HMS, demonstrating the good stability of catalyst.

Reference

- 1 Y. Wang, J. Yao, H. Li and et al, *J. Am. Chem. Soc.*, 2011, 133, 2362
- 2 M. Chatterjee, H. Kawanami, M. Sato and et al, *Adv. Synth. Catal.*, 2009, 351: 1912