

Supporting Information Available:

A facile route to cage-like mesoporous silica coated ZSM-5 combined with Pt immobilization

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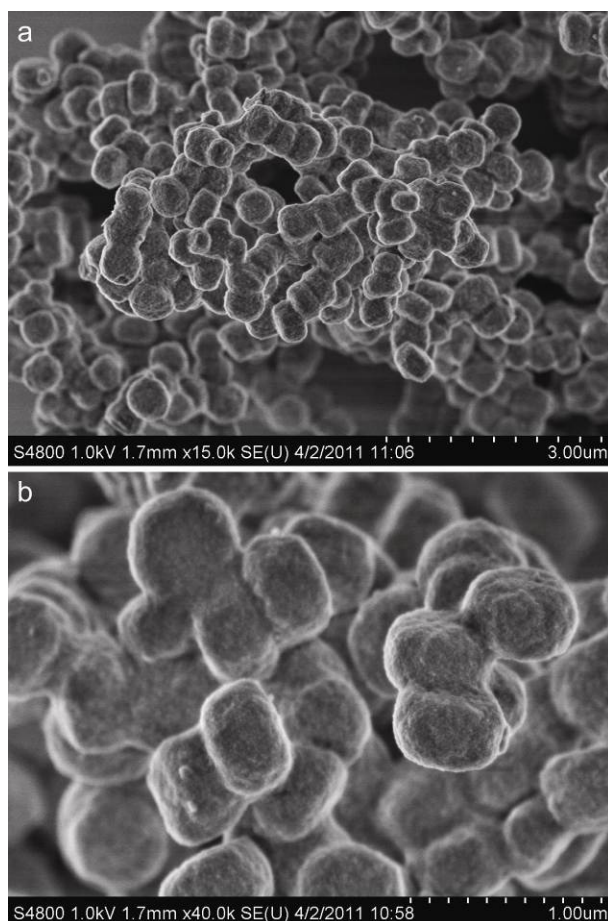


Figure S1. SEM images of the cage-like meso-/micro-porous core-shell composites HZ@CmesoSiO₂ with a shell thickness of ~ 70 nm prepared by using acid catalyzed sol-gel coating process and triblock copolymer F108 as a mesostructural template.

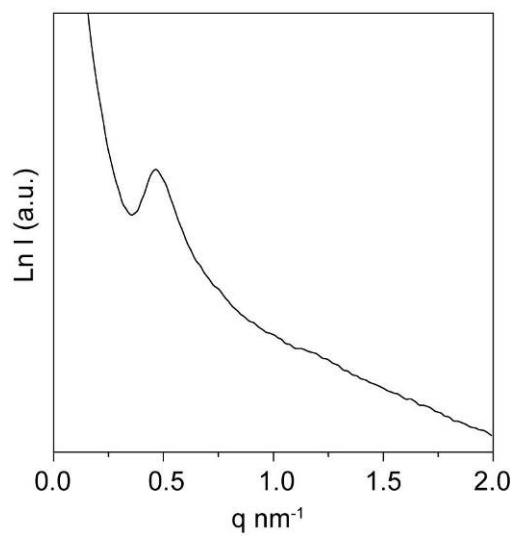


Figure S2 The SAXS pattern of the core-shell composites HZ@CmesoSiO₂ with a shell thickness of ~ 70 nm.

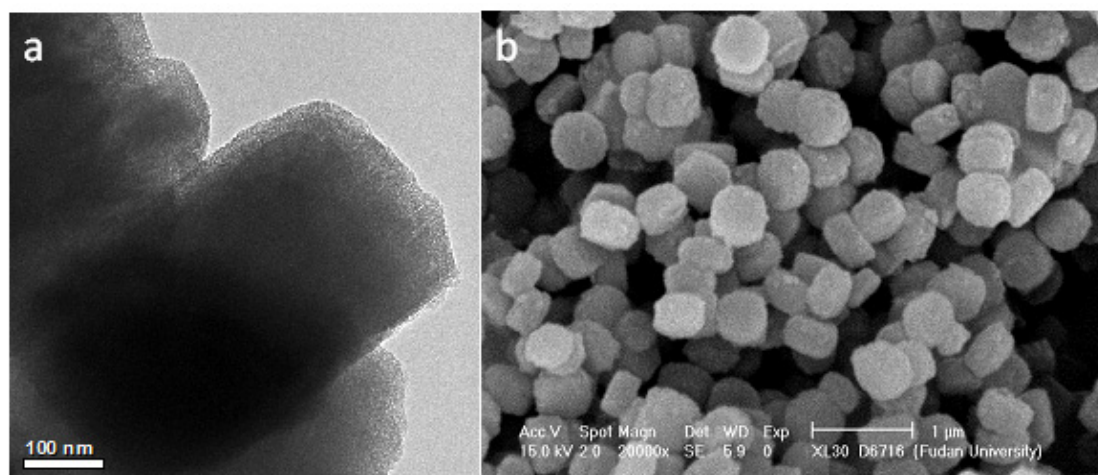


Figure S3 TEM (a) and SEM (b) images of the core-shell composites HZ@CmesoSiO₂ with a shell-thickness of ~ 25 nm.

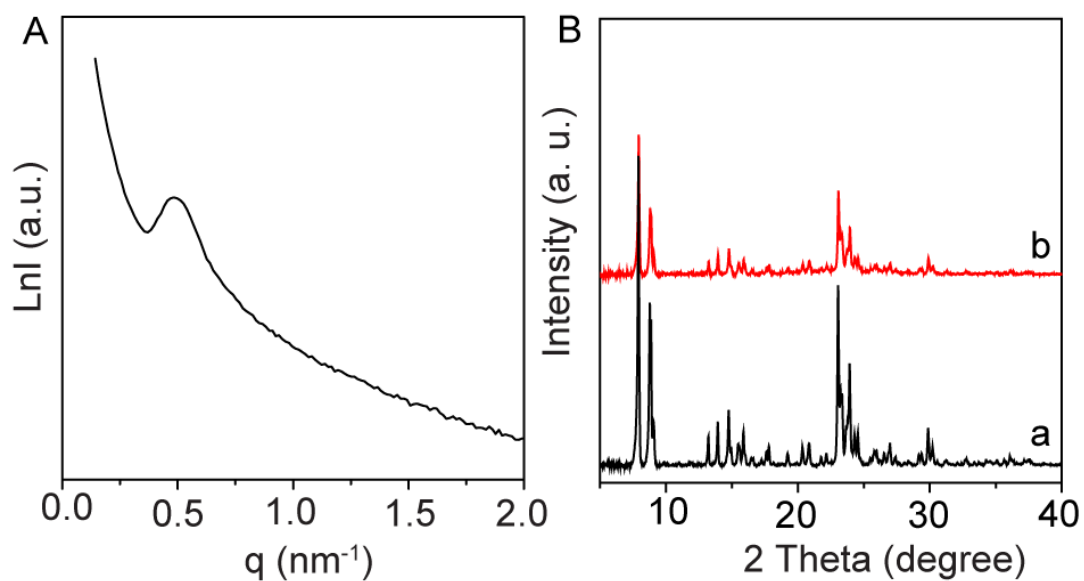


Figure S4 The SAXS (A) of the Pt/HZ@CmesoSiO₂ composites and the wide-angle XRD patterns (B) of the pristine HZSM-5 (a) and Pt/HZ@CmesoSiO₂ composites (b).

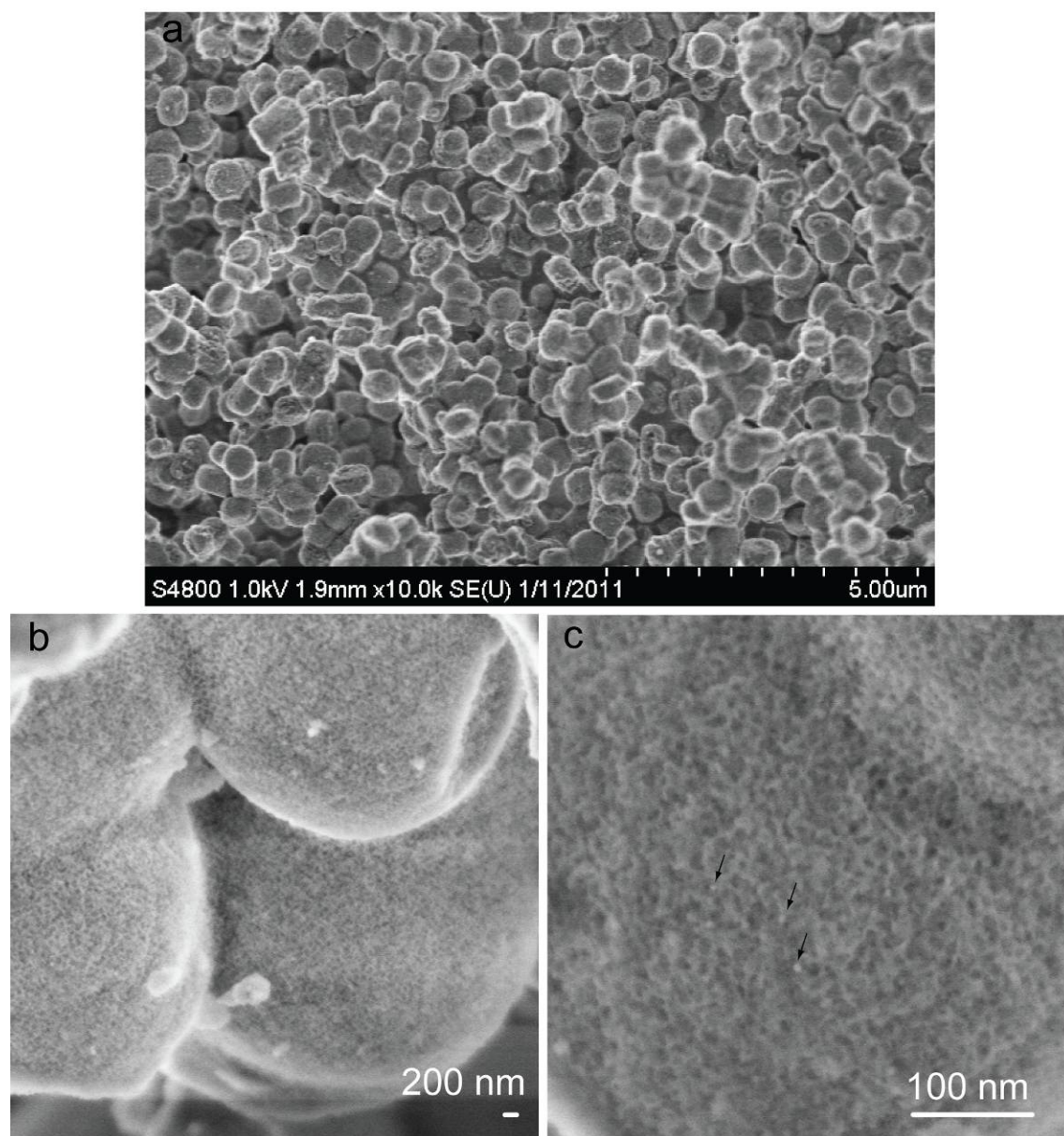


Figure S5 The FESEM images with different magnification for the Pt immobilized core-shell composite molecular sieve (Pt/HZ@CmesoSiO₂) with cage-type mesopores, showing uniform core-shell particles and cage-like mesoporous silica shells covered on the zeolite crystals. The black arrows in the image (c) indicate the bright dots of the Pt nanoparticles.

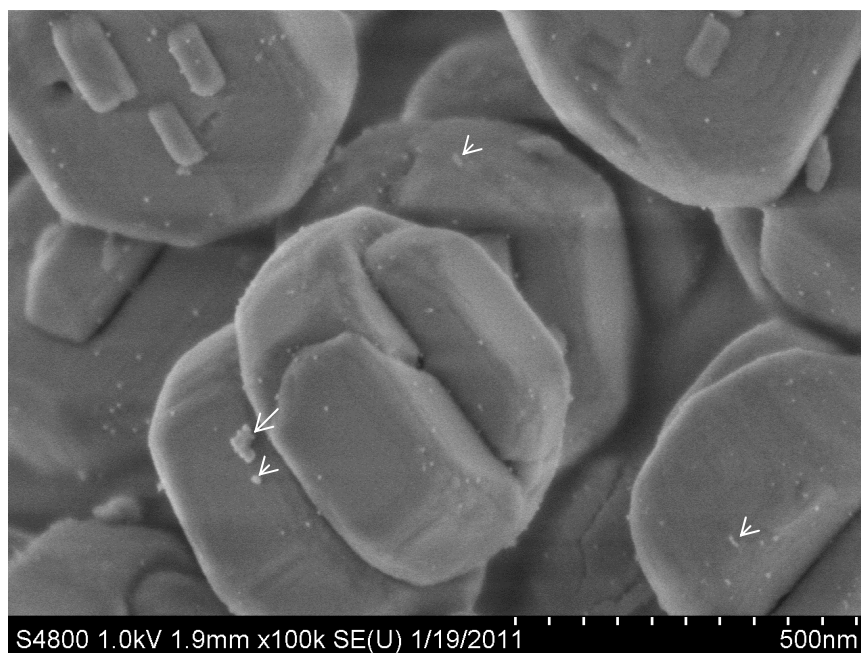


Figure S6 The FESEM image of the sample Pt/HZSM-5 prepared by a wet-impregnation method using $[\text{Pt}(\text{NH}_3)_4\text{Cl}_2 \cdot x\text{H}_2\text{O}]$ as a platinum source, showing a plenty of Pt bright dots on smooth surface of zeolite particles. The white arrows point out some aggregated platinum particles.

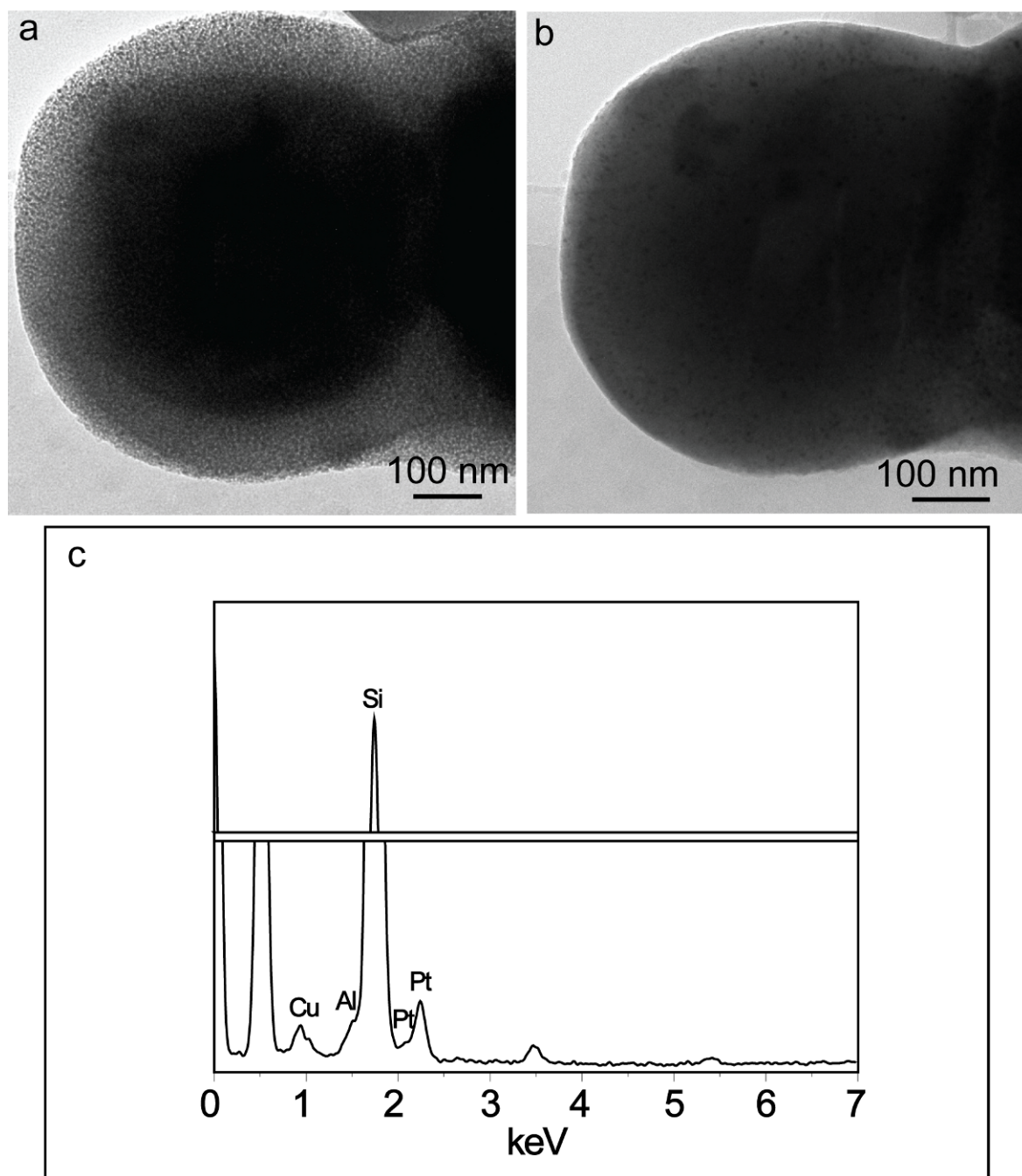


Figure S7 TEM images of a Pt-immobilized core-shell particle in Pt/HZ@CmesoSiO₂ composite taken at different times showing a large plenty of Pt nanoparticles well-dispersed in a cage-like mesoporous core-shell composite, showing that a core-shell particle has a little shrinkage under irradiation of electron beams. The corresponding EDX pattern is given in (c).