

**Designed Synthesis of Sulfonated Polystyrene/Mesoporous Silica
Hollow Nanospheres as Efficient Solid Acid Catalysts**

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Supplementary Materials

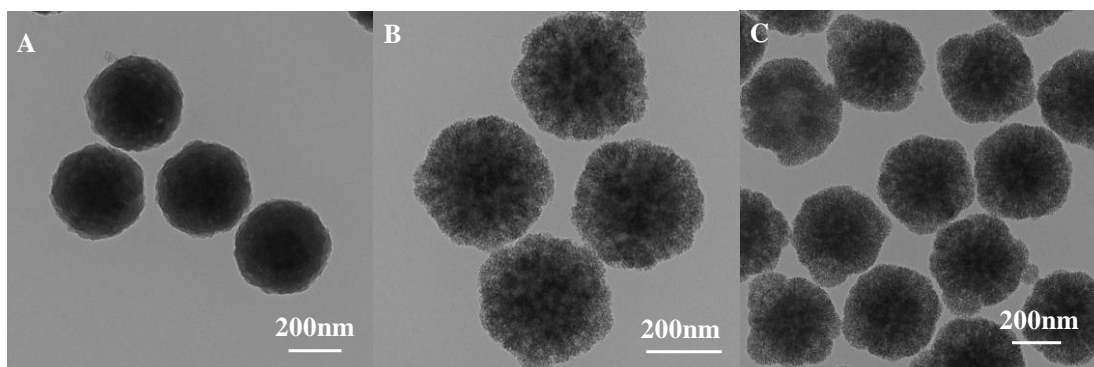


Figure S1. TEM images of PS/SiO₂ CSNs (A), PS/2.5PMA-SiO₂ CSNs (B) and PS/3.3PMA-SiO₂ CSNs (C).

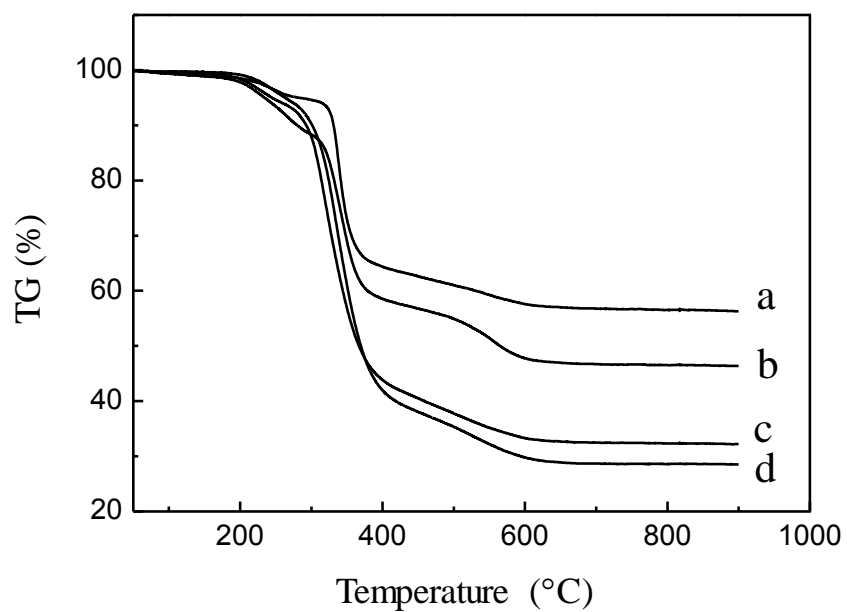


Figure S2. TG curves of the samples for PS/SiO₂ HN (a), PS/SiO₂ HN after THF extraction (b), PS/5PMA-SiO₂ HN (c) and PS/5PMA-SiO₂ HN after THF extraction (d).

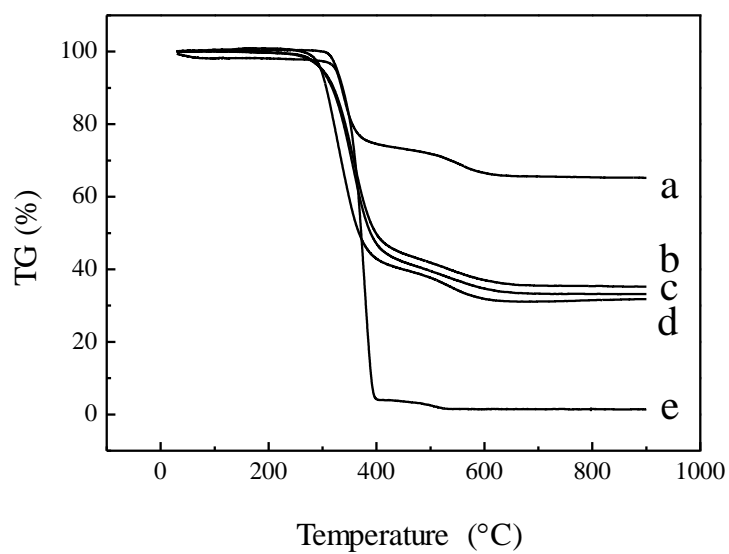


Figure S3. TG curves of the samples for PS@SiO₂ HNs (a), PS/5PMA-SiO₂ HNs (b), PS/3.3PMA-SiO₂ HNs (c), PS/2.5PMA-SiO₂ HNs (d) and PS template nanospheres (e).

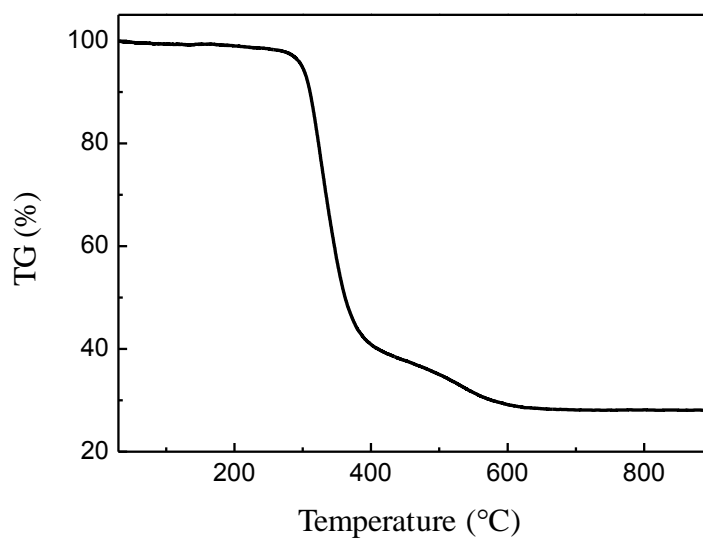


Figure S4. TG curves of the samples for PS/2.5 PMA-C8-SiO₂ HNs

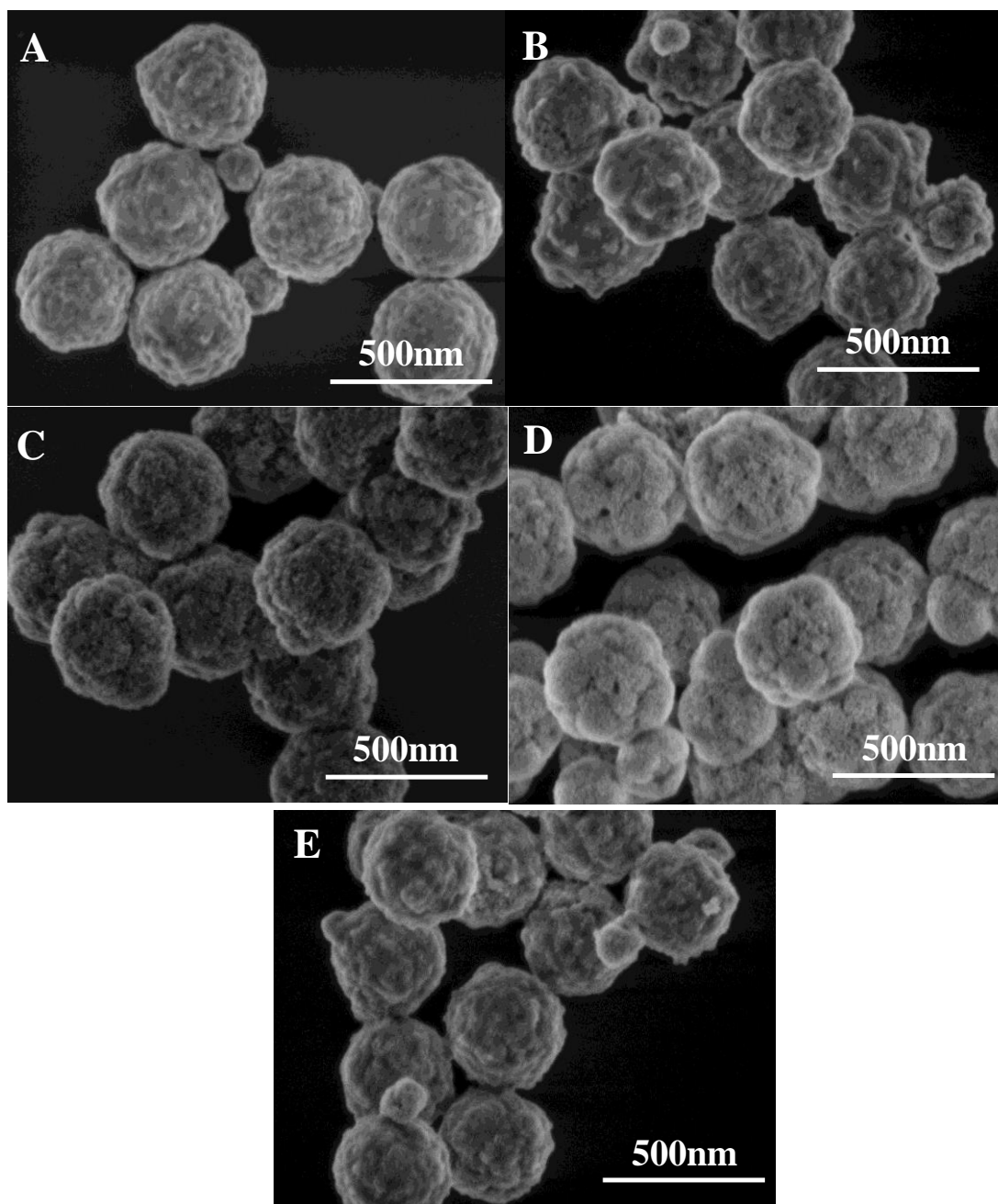


Figure S5. HR-SEM images of PS-SO₃H/SiO₂ HNAs (A), PS-SO₃H/2.5PMA-SiO₂ HNAs (B), PS-SO₃H/3.3PMA-SiO₂ HNAs (C), PS-SO₃H/5PMA-SiO₂ HNAs (D), and PS-SO₃H/5PMA-C8-SiO₂ HNAs (E).

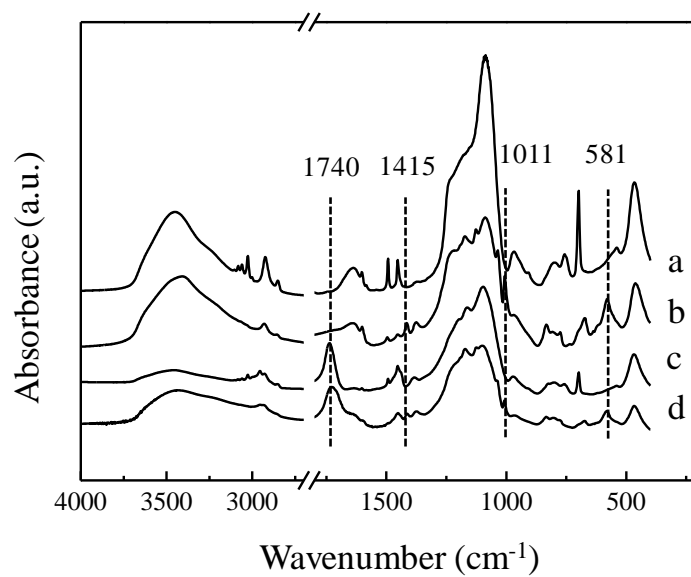


Figure S6. FT-IR spectra of PS/SiO₂ HN_s (a), PS-SO₃H/SiO₂ HN_s (b), PS/5PMA-SiO₂ HN_s (c) and PS-SO₃H/5PMA-SiO₂ HN_s (d)

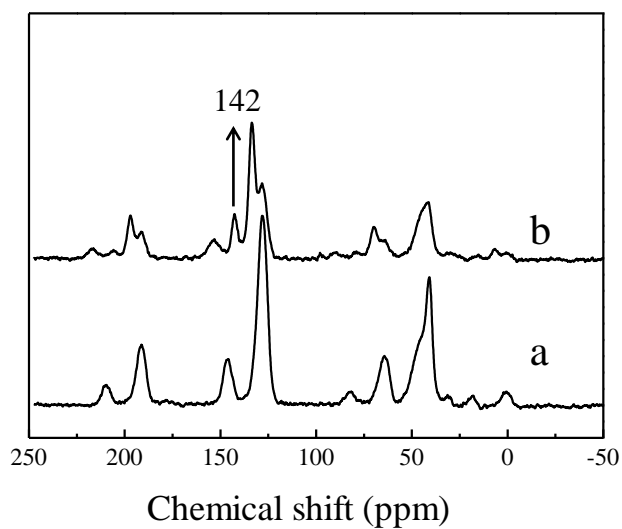


Figure S7. ¹³C NMR spectra of PS/SiO₂ HN_s (a) and PS-SO₃H/SiO₂ HN_s (b)

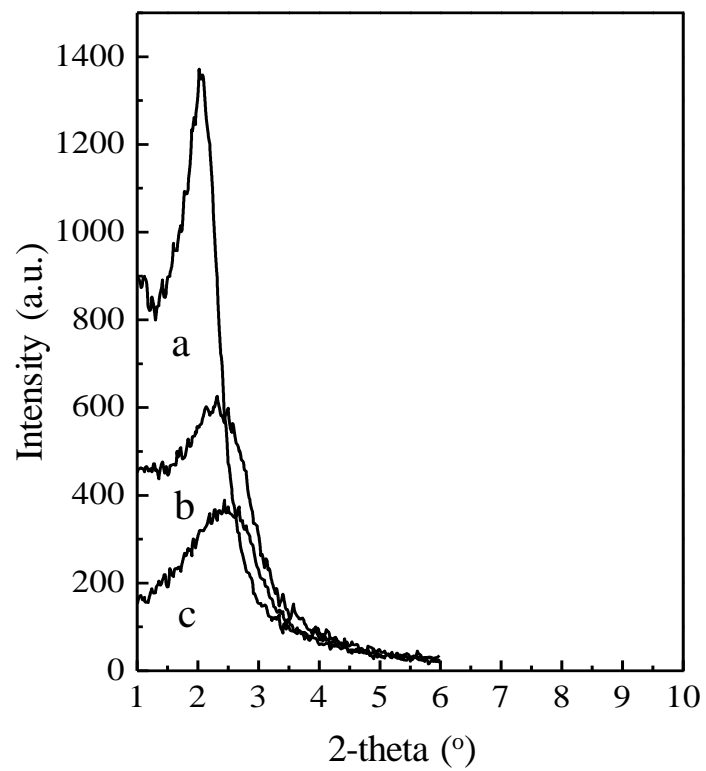


Figure S8. XRD patterns of PS/SiO₂ HNs (a), PS/5PMA-SiO₂ HNs (b) and PS-SO₃H/5PMA-SiO₂ HNs (c)