

Controllable synthesis of hierarchical nanostructured hollow core/mesopore shell carbon for electrochemical hydrogen storage

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Supporting Information

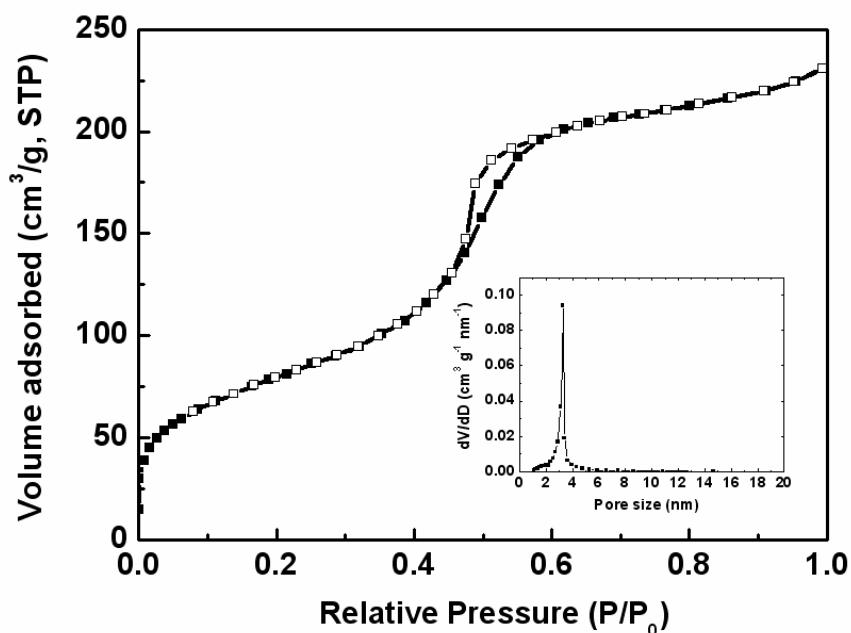


Figure S1. Nitrogen adsorption–desorption isotherms for the SCMS_{190/42} silica template employed for the preparation of HN-HCMSC_{180/40}, solid square: adsorption, open square: desorption.

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Table S1. Structural parameters for the various solid core/mesoporous shell silica templates.

Sample	BET area (m ² /g)	<i>V</i> _{total} (cc/g)	<i>V</i> _{micro} (cc/g)	Pore size (nm)
SCMS _{190/42}	298	0.36	0.07	3.4
SCMS _{275/43}	257	0.31	0.06	3.4
SCMS _{360/45}	201	0.25	0.05	3.3
SCMS _{360/75}	223	0.28	0.06	3.2

Generally, the core size and shell thickness of the HCMSC replica suffer a shrinkage of 2 ~ 5 % compared to those of its parent silica template after the carbonization of the silica/polymer composite at high temperature and the removal of silica.¹⁻³ For example, the HCMSC_{180/40} replica was generated from its parent silica template, SCMS_{190/42}, which has a core size of ca. 190 nm and shell thickness of ca. 42 nm.

References

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- (2) Kim, J.Y.; Yoon, S.B.; Yu, J.-S. *Chem. Commun.* 2003, 790.
- (3) Yu, J.-S.; Yoon, S.B.; Lee, Y.J.; Yoon, K.B. *J. Phys. Chem. B* 2005, **109**, 7040

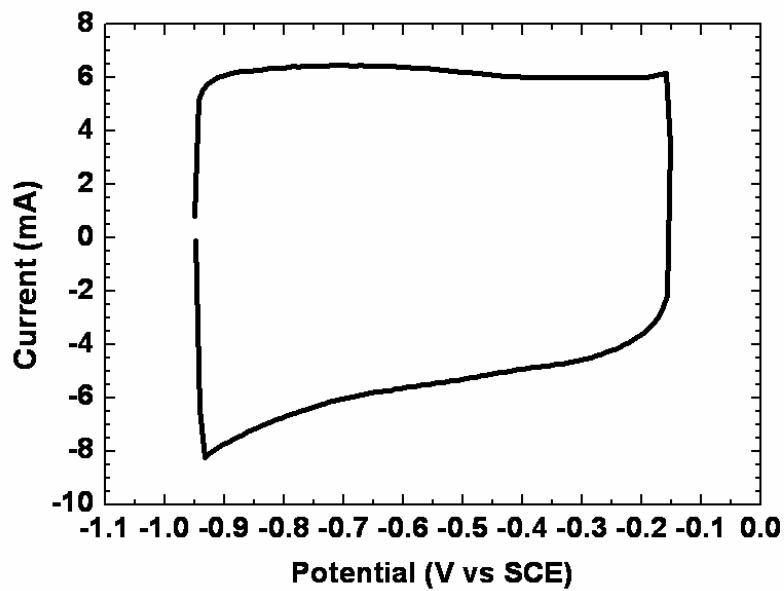


Figure S2. A representative cyclic voltammogram for the hierarchical nano-structured hollow core/mesopore shell carbon with core size of 180 nm and shell thickness of 40 nm in 6 M KOH at a scan rate of 5 mV/s. Active material mass: 5.8 mg.