Electronic Supplementary Information

Fabrication of hollow core carbon spheres with hierarchical nanoarchitecture for ultrahigh electrical charge storage

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Preparation of "Pure silica"

"Pure silica" (i.e., solid core /mesoporous shell (SCMS) silica) was fabricated based on a modified Stöber method.[1,2] A typical synthesis route for SCMS silica is as follows. A total of 40 mL of aqueous ammonia (32 wt %) was added to a solution containing 1 L of ethanol and 80 mL of deionized water. After stirring at 30 °C for ca. 15 min, 60 mL of tetraethyl orthosilicate (TEOS, 98%, ACROS) was added and the reaction mixture was stirred for ca. 6 h to yield uniform silica spheres. Next, a mixed solution containing 50 mL of TEOS and 20 mL octadecyltrimethoxysilane (C18TMS) (90% tech., Aldrich) was introduced into the as-prepared colloidal solution containing the silica spheres, and the mixture was further reacted for 1 h. The resulting octadecyl group incorporated silica solid core/shell nanocomposite was retrieved by centrifugation, dried at room temperature, and further calcined at 823 K for 6 h under an oxygen atmosphere to produce the final SCMS silica material. The silica sphere can be produced in various sizes by controlling the amount of TEOS added into the aqueous ammonia, and the SCMS silica can be produced in various sizes and various shell thicknesses by using the solid silica spheres with various sizes and adjusting the molar ratio of C_{18}-TMS to TEOS, respectively.[3]

Reference

(1) Yoon, S.-B.; Sohn, K.-N.; Kim, J.-Y.; Shin, C.-H.; Yu, J.-S; Hyeon, T. *Adv. Mater.* **2002**, *14*, 19-21.

(2) Fang, B.-Z.; Kim, J.-H.; Kim, M.-S.; Yu, J.-S. *Langmuir* **2008**, *24*, 12068-12072.

(3) Kim, J. Y.; Yoon, S. B.; Yu, J.-S. *Chem. Commun.* **2003**, 790-791.

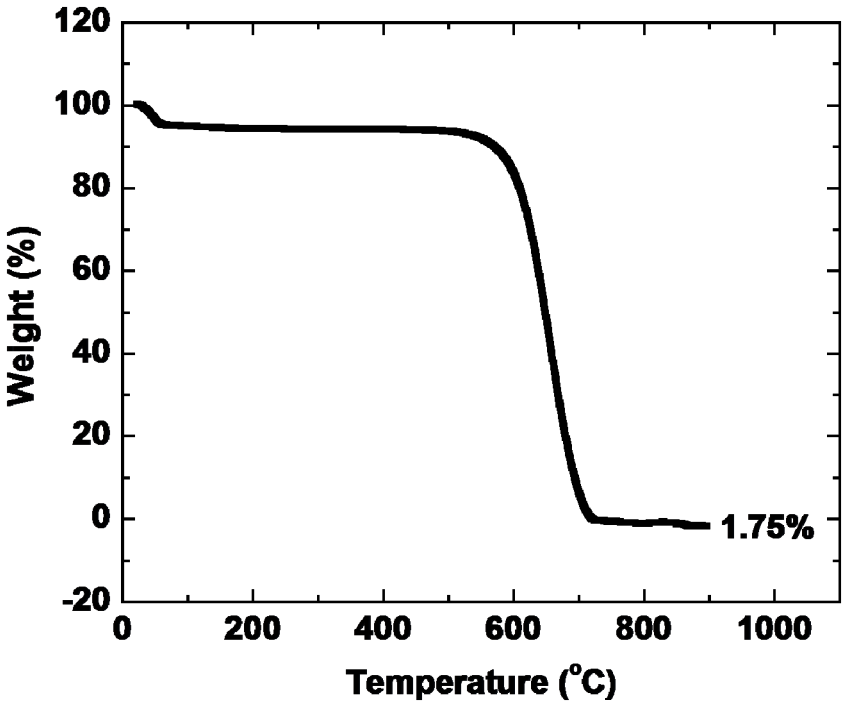

Figure S1. TGA curve for the HCCS.

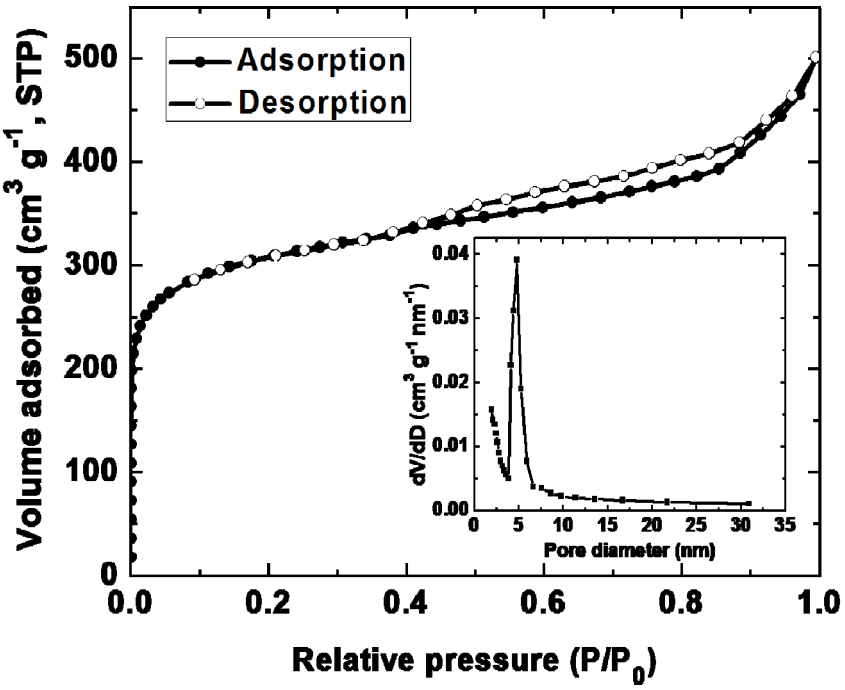

Figure S2. Typical nitrogen adsorption-desorption isotherm at 77 K and the derived PSD for activated carbon Norit SX plus.

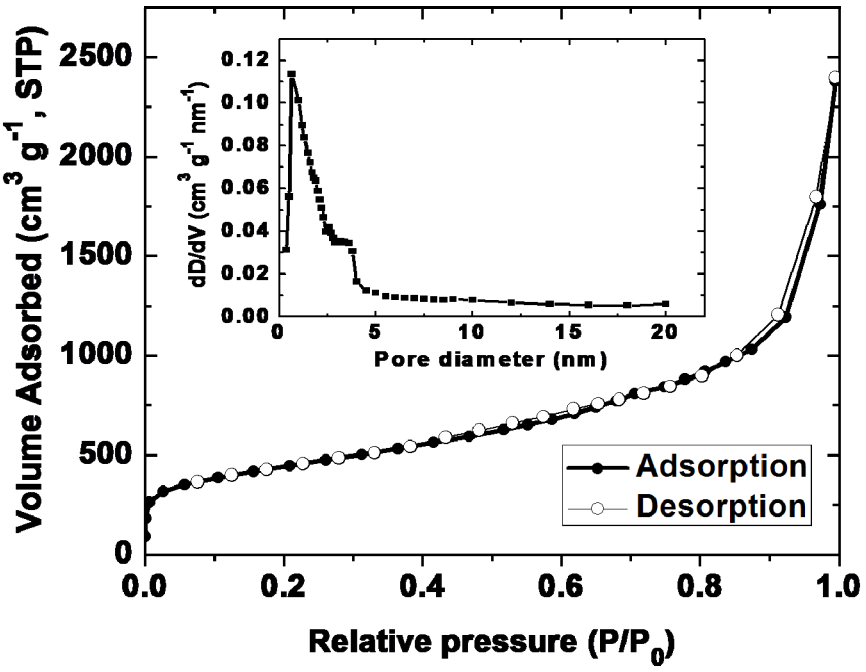

Figure S3. Typical nitrogen adsorption-desorption isotherm at 77 K and the derived PSD for carbon black pearls 2000.