

## Fine tuning of size and polydispersity of hollow carbon spheres

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Due to their morphology, low density and high surface area hollow carbon spheres have attracted much attention in several fields for applications in catalysts, energy storage-media, or drug delivery. Furthermore, their use as building blocks to produce high ordered structures is also an appealing feature in photonics. [1, 2]

In this work the optimized conditions for the preparation of hollow carbon spheres have been studied by means of a 2-step method. This method involves the use of polystyrene beads as seeds and glucose as precursor in a hydrothermal treatment [3] followed by further carbonization at high temperatures. [4] The concentration of polystyrene beads, size, polystyrene/glucose ratio, hydrothermal and carbonization temperatures as well as reaction time allow for a fine tuning of the size (100-1000 nm) and monodispersity (<4%) of the final carbon shell structures. Figure 1a show a SEM image of carbon spheres produced with initial 260 nm polystyrene beads as seeds where broken spheres evidence the empty cores (Figure 1b).

[1] T. Zhang, Q. Zhang, J. Ge, J. Goebel, M. Sun, Y. Yan, Y. Liu, C. Chang, J. Guo, and Y. Yin, *J. Phys. Chem. C.*, **113** (2009) 3168.

[2] M. Goodman, K. Arpin, A. Mihi, N. Tatsuda, K. Yano, and P. Braun, *Adv. Optical Mater.*, **1** (2013) 300.

[3] R. White, K. Tauer, M. Antonietti, and M. Titirici, *J. Am. Chem. Soc.*, **132** (2010) 17360.

[4] Q. Wang, H. Li, L. Chen, X. Huang, *Carbon*, **39** (2001) 2211.

### Figures

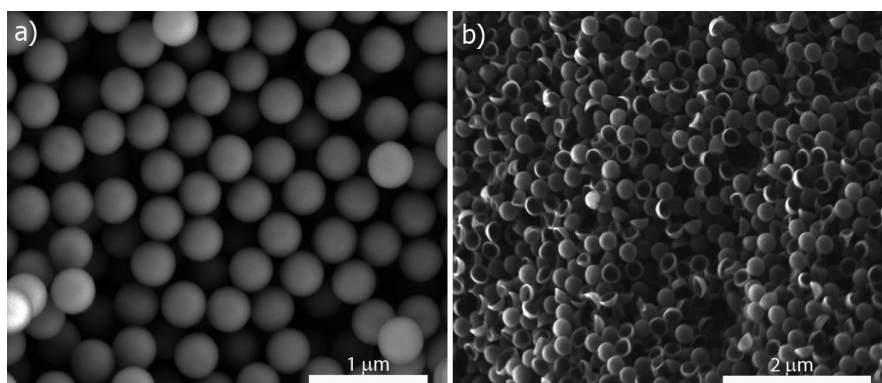


Figure 1a) Hollow carbon spheres obtained from polystyrene beads as seeds. b) Broken spheres evidencing empty cores.