# Reversibly Compressible Carbon Spherogels

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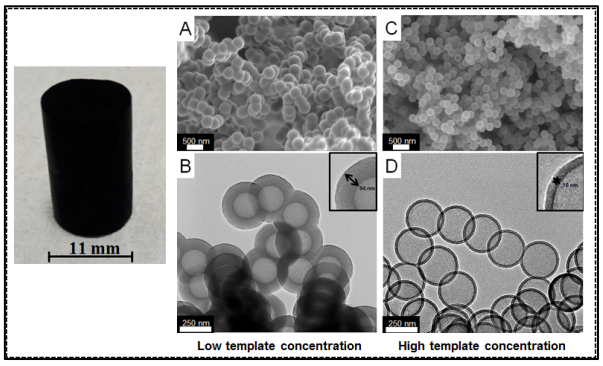
Carbon aerogels are open porous solids with surface areas up to 2500 m2/g. Offering also electrical conductivity, these materials are also highly promising for applications such as energy storage (electrodes for supercapacitors), capacitive desalination, catalysis, adsorption, or filtration. We have developed a facile templating strategy to tailor the morphology and pore structure of carbon aerogels [1]. By applying an adequate amount of polystyrene spheres to a resorcinol-formaldehyde sol, subsequent gelation, supercritical drying and carbonization, monolithic carbon aerogels are designed with a substructure only consisting of hollow spheres, which we call spherogels [2]. We show the versatility of this approach to a) adjust the hollow core diameter, b) obtain a controlled pore wall thickness with microporosity, and c) control the chemical and structural homogeneity. All materials were characterized by electron microscopy (SEM, TEM), small angle X-ray scattering (SAXS), and nitrogen gas sorption. The mechanical and electrochemical properties are discussed with respect to their structural characteristics and compared to reference carbon aerogel materials.




[1] M. Salihovic, N. Huesing, J. Bernardi, V. Presser and M. S. Elsaesser RSC Adv. 2018, 8, 27326

[2] M. Salihovic, N. Huesing, M. Ulbricht, G. Popovski, O. Paris, V. Presser, M. S. Elsaesser under review