Pyrolytic Organic aerogels Based on Cellulose Bacterial and fibroin silk for Applications Supercapacitors .

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The breakthrough in the development of new electronic technologies, have significantly increased the demand for new forms of high-power energy storage. [1]

Supercapacitors are promising devices for these purposes, because they have great capacity of storage electrical loads due to its high intrinsic capacitance. In addition, it is able to release quick electric current and to lodge reduced size. Carbon structures are excellent materials to compose plate's capacitors, due to its large surface area, high electric conductivity and low cost [1]. In this work is proposed the development of carbon structures with different morphologies from bacterial cellulose membranes (MCB). MCB are three-dimensional structures formed by interconnected cellulose fibers with diameters below 100 nm, a high degree of polymerization and crystallinity, resulting in a high mechanical resistance[2]. MCB were dried in supercritical CO_2 to get their respective organic aerogels, mesoporous solids materials, which maintains a three-dimensional structure of the precursor MCB, resulting in materials with porosity higher than 95% [3]. How a mode to increase still more the resistance of MCBs without causing structural changes, were produced composites of bacterial cellulose aerogels containing fibroin, that was extracted from cocoons of the silkworm (*Bombyx mori*)[4].

The carbon structures were obtained for the pyrolysis of bacterial cellulose aerogels/fibroin in adapted oven at 1000°C and argon atmosphere. The carbon aerogels have structures with high porosity and greater mechanical strength than the structures that gave rise to them. They are further characterized with respect to its conductive and capacitive properties.

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