Light-induced synthesis of ordered mesoporous carbons

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Triggered by their promising properties in different fields (electrochemistry, drug delivery, catalysis) the synthesis of ordered mesoporous carbons has become a largely investigated topic. First mesoporous carbon materials were prepared by hard-templating methods using ordered mesoporous silica scaffolds. Soft-templating approaches are more interesting ones as they overcome the limitations of high cost and the removal of the template. In this regard, various forms of self-assembly of block copolymers and phenolic resins (solvent-induce, aqueous routes) have been proposed to obtain mesoporous carbons of varied pore architectures, but most of them are still based on complex and time-consuming synthesis procedures. Following our recent studies on the use of light to accelerate to self-assembly reactions of phenolic resins and other polyhydroxylated compounds to obtain nanoporous carbons with tuned textural features within the micro-mesopore range, we herein report the synthesis of ordered carbons by the photo-induced assembly of adequate organic precursors. The irradiation of the precursor's mixture for 60 min at room temperature allowed to obtain resins with a cross-linked structure, which pyrolysis rendered carbons with the typical patterns of body-centered cubic structure viewed along different directions, indicating a highly ordered mesopore structure.