Electrochemical analysis of supercapacitor with ordered mesoporous carbon in a different carbonization temperature

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The supercapacitors store electrical energy using EDLC or pseudo-capacitors. Supercapacitors can be alternative approach to solving increasing power demands because they can deliver energy at high rates and store high power compared to batteries. There are two conditions to improve electrochemical performance of supercapacitors. First, electrode materials have high surface area or pseudo-active species for high energy density. Second, high electrical conductivity of the electrode materials is a important factor for high rate capability. Ordered mesoporous carbons have been known as candidate electrode materials because of its huge specific surface area, electrical conductivity, chemical stability, controllable porosity and pseudo-active sites for a variety of redox reactions. However, amorphous phase of ordered mesoporous carbons cause relatively low electrical conductivity. To increase electrical conductivity, we regulate carbonization temperature from 900℃ to 1450℃. In our study, ordered mesoporous carbons were synthesized by hard template method through impregnation the carbon precursor into the template(SBA-15) then carbonization at 900℃, 1200℃, 1350℃, and 1450℃.