Nanoscale Engineering: Activated Pecan Shell for EDLC Application

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Supercapacitors (SCs) are promising energy storage devices due to their fast charge-discharge speed, long-term cycling stability, high power/energy density and high safety. In this study, pecan shells, an abundant agricultural waste of the nut industry, were physically activated and fabricated into electrodes for supercapacitors. The pecan shells were activated with the aim of producing electrode material with a high specific surface area along with an interconnected porous structure. The specific high surface area (1,554 m2/g) was obtained from activated pecan shell activated at 1050°C for 10 hours (PS-10). The high specific surface area and balance of micro- and mesopores, indicates PS-10 to be an ideal electrode for supercapacitors. For future work, the long and energy-heavy activation in this study can be reduced with chemical activation.

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