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Rice Husk Derived Activated Carbon/Polyaniline Composites As Active Materials For Supercapacitors

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Composite materials (CM) "carbon/polyaniline" were synthesized using porous activated carbon (AC) produced from carbonized rice husk, which has specific surface area 2265 m^2g^{-1} measured by direct BET method . The series of the CM was synthesized by oxidative aniline polymerization method in the presence of the AC in acidic medium; polyaniline (PAni) content was varied from 18 to 60 wt. %. Electrochemical and properties of the CM were investigated by cyclic voltammetry, galvanostatic charge/discharge and stability tests. Results indicate that properties of the composites are governed by ratio of the components: a form of cyclic voltammogram curves and location of specific ox-red polyaniline peaks strongly depend on the PAni amount. Gravimetric capacitance grows with polymer content in the material and reaches maxima 465 $F \cdot g^{-1}$ in 1M H_2SO_4 at discharge current density 0.2 $A \cdot g^{-1}$ for the sample with polyaniline content 60 wt %. However, durability tests show that the most stable is the sample with the lowest (18 wt. %) polyaniline amount.

Keywords: Activated carbon, Composite materials, Polyaniline, Rice Husk, Synergetic effect.

FULL TEXT