



COIN2022

CONTEMPORARY BATTERIES AND SUPERCAPACITORS

INTERNATIONAL SYMPOSIUM
BELGRADE 2022

PROGRAM AND BOOK OF ABSTRACTS

June 1-2, 2022,
Serbian Academy of Sciences and Arts
Belgrade, Serbia

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a) Батерије - Апстракти

Electrochemical Properties of Active Carbon Materials Obtained from Biowaste

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Activated carbons were successfully prepared using biowaste as a cheap and renewable raw material. Carbonization was performed on biomass first under nitrogen N₂ atmosphere at 850°C, and then were physical activated at different temperatures and different times of activation in atmosphere of carbon dioxide CO₂. The influence of temperature and time of activation on physical, structural and morphological properties was studied by XRD, Raman spectroscopy, FTIR, BET, SEM analysis. The increase of temperature and activation time leads to the increase of specific surface area of carbon material. The charge storage ability was evaluated and systematically studied by means of Cyclic Voltammetry and Impedance method. The specific discharge capacitance of activate carbon materials in different pH–aqueous electrolytes (KOH, Na₂SO₄ and H₂SO₄), increases with the surface area, indicating that the double layer charging is controlled primarily by the development of surface porosity. The active carbon material with the most developed porosity maintained a high capacitance of 110.06 Fg⁻¹ in KOH, 80.62 Fg⁻¹ in Na₂SO₄ and 126.9 Fg⁻¹ in H₂SO₄, at a very high scan rate of 300 mVs⁻¹. The micro/mesoporosity, depending on the type of aqueous electrolyte, was found to control not only the specific capacitance of materials, but also the hydrogen storage, C–H bonding and the relaxation time of adsorption.