



Contribution ID: 141

Type: Oral

## The porous carbon derived from the KOH activation of agro-waste char for supercapacitor electrode

*Monday, November 28, 2016 3:55 PM (15 minutes)*

By using KOH as the chemical activating agent to prepared activated carbon from pineapple leaf fiber waste as the carbon source. The structure, morphology and the surface functional groups of the as-prepared activated carbon were investigated by X-ray diffraction (XRD), field emission scanning electron microscope equipped with energy dispersive X-ray spectroscopy (FESEM-EDX), X-ray photoelectron spectroscopy (XPS), respectively. The electrochemical behavior and performance of the as-synthesized activated carbon electrode were measured by the cyclic voltammetry (CV) and the electrochemical impedance spectroscopy (EIS) in 1 M Na<sub>2</sub>SO<sub>4</sub> electrolyte solution by using the three electrode setup. The activated carbon electrode exhibited the specific capacitance of 131.3 F g<sup>-1</sup> (5 mV s<sup>-1</sup>) with excellent cycling stability. The capacitance retention after 1,000 cycles was about 97% of the initial capacitance at a scan rate of 30 mV s<sup>-1</sup>. Given good electrochemical properties along with the simple accessibility make this activated carbon electrode a promising candidate in future large-scale production of the electrochemical capacitors (ECs).

Keywords: Electrochemical capacitors, Biochar, Activated carbon, Pineapple leaf fiber, Agro-waste base materials

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**Session Classification:** Heron 1

**Track Classification:** Nano-energy & storage