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A high capacity carbon prepared from sweet sorghum stalk for supercapacitor applications

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Introduction
Due to over reliance of fossil resources for fuel and chemicals, the resultant global warming and pollution has led to research being conducted on other alternatives for renewable energy and storage systems that can be produced using more sustainable methods. This involves the development of storage systems that have a high energy density and a long-life span (Batteries, supercapacitors and solar cells). Batteries have high energy capacity, but they are limited by their low power density and low cycle life. A supercapacitor possesses unique qualities of high-power density, high cycle stability, and rapid charge-discharge performance but a low energy density.
Supercapacitors can be evaluated based on their electrode material and electrolyte performance. The energy density is largely determined by the electrode materials. As such, studies on improving the performance of electrodes via the development of new electrode materials are increasing. Biomass has been sought as a substrate for carbon electrode materials. This study therefore explores porous carbon derived from Sweet Sorghum Stalk to make supercapacitor electrodes that exhibit long cycling life, high specific capacitance when implored in a two-electrode system.

1. Results

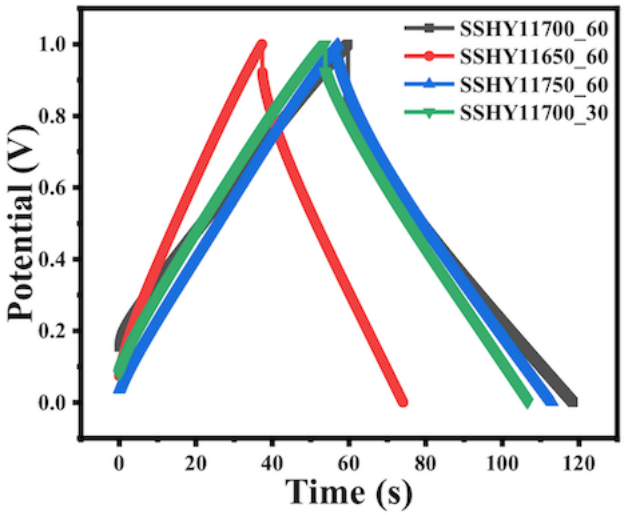

Figure 1: enter image description here

Fig 1. Galvanostati Charge-Discharge

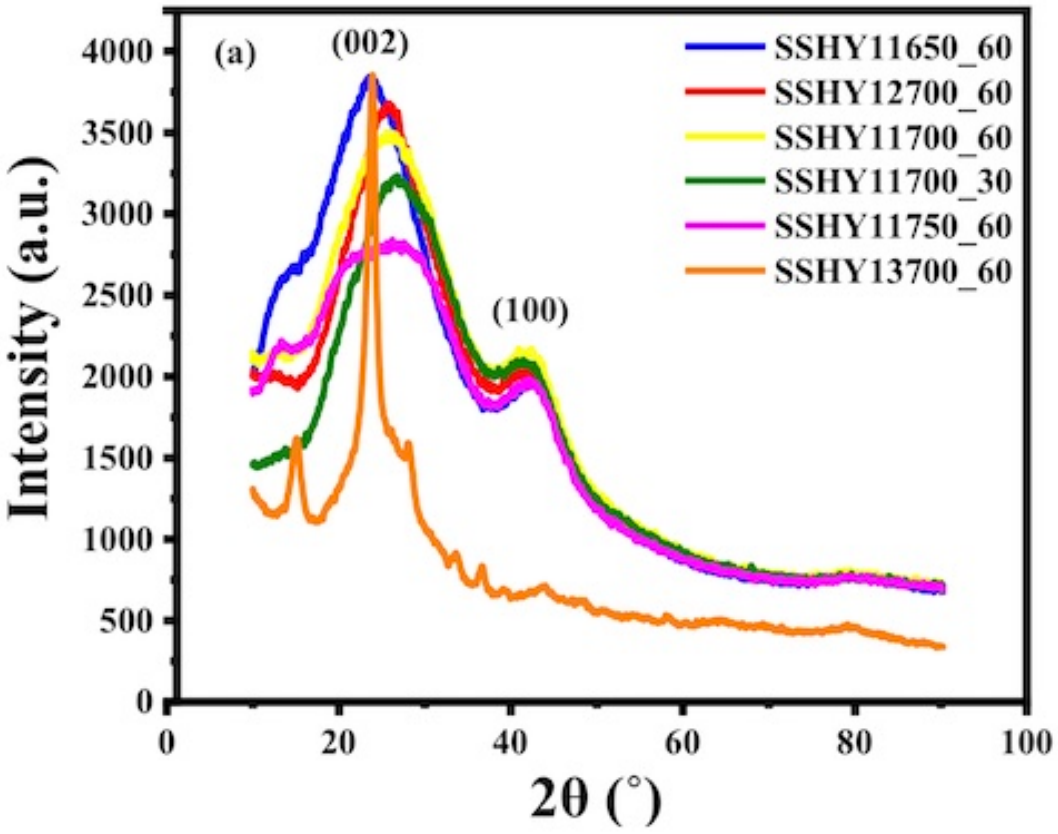

Figure 2: enter image description here

Fig 2. XRD graphs

1. References Z. Li, J. Wang, S. Liu, X. Liu and S. Yang, "Synthesis of hydrothuermally reduced graphene/MnO2 composites and their electrochemical properties as supercapacitors," Journal of Power Sources, vol. 196, no. 19, pp. 8160-8165, 2011.
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