ABSTRACT

In the present research, thin films of Co_2SnO_4 were produced on transparent glass slides and nickel-based foam substrates using an aqueous spray pyrolysis deposition process at 370 degrees Celsius. Electrochemical experiments revealed pseudo-capacitive characteristics. When the scan rate has been adjusted to 2 mVs^{-1}, the maximum specific capacitance value is 3448 Fg^{-1}.The results demonstrate that Co_2SnO_4 with the greatest CS-3 concentration achieved the best specific capacitance of 3862 F g^{-1} in a 3 M KOH solution at an average current density of 1 Ag^{-1}.

The amazing electrochemical properties of Co_2SnO_4 composites suggest that these materials might be beneficial as electrodes in high-energy-density supercapacitors. The experiment involved electrochemical impedance spectroscopy across a frequency range of 0.1 to 1000 Hz. This study suggests that Co_2SnO_4 composites have tremendous promise for developing realistic supercapacitors due to their exceptional electrochemical properties.