

Capacitance measurements under the influence of closing torque in a symmetric two electrodes electrochemical cell

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The constant evolution of technologies requires intelligent use of available energy, which implies more efficient energy storage devices. In the last decades, supercapacitors have received great scientific and technological attention due to their important qualities among the high life cycle, high power density and variety of applications. Electrochemical analyses are a very important way to evaluate the supercapacitor performance, consequently, its assembly (two or three electrodes) make a difference in this analysis. This influence was analyzed using two symmetric activated carbon felt as electrodes, in a 2 M of H₂SO₄ medium. The electrochemical cell was equipped with a torque wrench and the closing force was varied in order to analyze its effect on the measurements. The behavior of the felt electrode was characterized electrochemically by galvanostatic charge/discharge curves, cyclic voltammetry and electrochemical impedance spectroscopy. The main results indicate that closing cell torque has directly influence on contact resistance and capacitance response. By torque control is possible increase about 30% of capacitance compared to a traditional hand closing Swagelock cell.