

A Study of the Electrochemical Performance of Strip Supercapacitors under Bending Conditions

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In recent years, much effort has been spent developing thin, lightweight and flexible energy storage devices to meet the various requirements of modern smart electronics. In this work, thin strip supercapacitors were successfully developed using activated carbon as the active electrode material. The electrochemical performance of these strip supercapacitors has been studied under mechanical bending conditions. The results indicate that the strip supercapacitor was functional under bending conditions between the bending angles of 30° to 150°. The capacitance of the sample was still about 70% of the original capacitance at different bending angles. This suggests the strip supercapacitor developed has a reasonable flexibility. Simulation model of equivalent circuit was established to analyze the charge transfer resistance (CTR) and equivalent series resistance (ESR) results in electrochemical impedance spectroscopy (EIS) testing. The correlation between the capacitance and the resistance of the strip supercapacitor under bending conditions was investigated and obtained.

Keywords: Flexible; Strip supercapacitors; Bending conditions

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