Abstract Submitted
for the DFD10 Meeting of
The American Physical Society

Ionic transport characterization of carbon-based porous materials

CARLOS RIOS-PEREZ, MARA SWEENEY, RAVITEJ KANAPURAM, ARNAV CHHABRA, JASON BOWMAN, CARLOS HIDROVO, The University of Texas at Austin — In the last few years, the transport of ionic species through a porous media and an electric field has been subject of intense research because of its many applications. The objective of the present work is to characterize ionic transport through a carbon porous media in a capacitive cell correlating its transient electrical parameters with its ion absorption performance. For this, a constant and continuous power supply, and carbon aerogel were employed in three types of experiments. In the first type, the electrical assembly is submerged in a stationary solution and the parasitic elements of the electric circuit were estimated. In the second type, ion-saturated aerogel was used in a series of polarity inversion cycles to evaluate its behavior. Finally, in the third type, convective effects on the ion migration were evaluated when a constant flow rate is applied. For all the experiments, the total capacitor's charge was obtained from the experimental current data and compared to the amount of ions retained on the carbon media estimated by the variation in the aerogel's weight and in the solution's conductivity.

Carlos Rios-Perez
The University of Texas at Asutin

Date submitted: 09 Aug 2010 Electronic form version 1.4