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Probing Ion Behavior in Porous Carbon Membranes Under Applied Electric Potential Through *In Situ* SAXS Experiments. FRANCISCO AYALA RODRIGUEZ, Department of Physics, The University of Texas at El Paso, PASQUALE F. FULVIO, University of Puerto Rico, Ro Piedras Campus, LAWRENCE M. ANOVITZ, Chemical Sciences Division, Oak Ridge National Laboratory, JOSE L. BAUELOS, Department of Physics, The University of Texas at El Paso — Ion transport and sorption kinetics in soft-templated mesoporous carbon is being studied using small-angle x-ray scattering technique (SAXS). Previous voltage-dependent small-angle neutron scattering (SANS) experiments have shown that this technique can be used to detect structural changes due to ion adsorption at the solid-liquid interface and in the structure of the carbon membranes as the voltage is varied. The average structure of the MC-127 membrane is being determined through the use of SAXS and SASview analysis software. MC-127 has a cylindrical morphology with an average pore-pore distance of 9.4nm. Other properties contribute to its SAXS signal: these include a small spherical shape due to micropores as well as the presence of a second structural correlation at distances larger than the pore-pore distance. To probe ion behavior, a prototype electrochemical cell previously used for SANS is being modified. Efforts are underway to test the cell's performance in a vacuum environment, and the overall electrochemical performance for a given electrode/electrolyte assembly. The current effort will aid the development of better supercapacitors with an optimized electrolyte and electrode geometry combination.

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