

Abstract Submitted  
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**Conformational transition of poly-benzimidazole in N,N-Dimethylacetamide/lithium chloride.** CHRISTOPHER SHOGBON, Rensselaer Polytechnic Institute, HAIFENG ZHANG, BRIAN BENICEWICZ, YVONNE AKPALU, Rensselaer Polytechnic Institute, Troy, NY., JEAN-LUC BROUSSEAU, Brookhaven Instruments Corporation, Holtsville, NY. — Static light scattering and circular dichroism techniques have been used for the first time to study the chain conformation of a previously synthesized *m*-PBI sample in DMAc/LiCl. The chain conformation was studied as a function of a) polymer concentration (0.1 to 20 mg/mL) at a fixed salt concentration of 4 % LiCl and b) salt concentration (0.05 to 7 %) at a fixed polymer concentration of 0.3 mg/mL. As polymer or salt concentration was increased, the chains collapsed initially, and then underwent fluctuations in size without a significant decrease in their average size. The collapse was associated with a conformational transition from random coil to an “extended wormlike” chain. At polymer concentrations greater than 9 mg/mL, the average size of the polymer chain is relatively constant at  $31.2 \pm 1.7$  nm. Circular dichroism measurements confirmed the conformational transitions that had been observed by indicating optical activity at polymer concentrations above 2 mg/mL. These results contribute to our overall understanding of chain stiffness and conformational transitions in PBI polymers, which may play an important role in the preparation of polymer electrolyte membranes via sol-gel processing.

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