Determination of the molecular parameters and studies of the aggregation behavior of polybenzimidazole in solution.[1] CHRISTOPHER SHOGBON, NYS Center for Polymer Synthesis, Department of Chemistry and Chemical Biology, Rensselaer Polytechnic Institute, Troy, NY, 12180, JEAN-LUC BROUSSEAU, Brookhaven Instruments Corporation, Holtsville, NY, 11742, HAIFENG ZHANG, BRIAN BENICEWICZ, YVONNE AKPALU, NYS Center for Polymer Synthesis, Department of Chemistry and Chemical Biology, Rensselaer Polytechnic Institute, Troy, NY, 12180 — Static light scattering using a seven angle BI-MwA instrument has been used for the first time to obtain the molecular parameters as well as study the aggregation behavior of previously synthesized m-PBI samples in DMAc/LiCl solvent mixtures. Depolarization ratios for the samples were obtained using a BI-200SM goniometer system. Molecular parameters obtained were $m-$PBI(118) M_w: 179,300 g/mol; R_g: 36.4 nm; A_2: 0.0016 cm^{3}mol/g^2 and $m-$PBI(159) M_w: 206,500 g/mol; R_g: 46.6 nm; A_2: 0.0020 cm^{3}mol/g^2. The aggregation behavior of m-PBI(159) was studied as a function of salt concentration (0 to 7 %) at a fixed polymer concentration of 0.3 mg/mL. With increasing salt concentration, R_g decreases initially and goes through three maxima with a minimum R_g of 31.0 nm at 4 % LiCl. This result parallels the previously observed aggregation behavior of corn amylase in DMAc/LiCl. Thus our results suggest a general mechanism for the aggregation of semiflexible polymers which can be controlled by varying polymer or salt concentration.

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