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Comparison of the KWW and BSW Model Descriptions of the Dynamic Responses of Polymeric and Colloidal Glass Formers BEN XU, GREGORY B. MCKENNA, Department of Chemical Engineering, Texas Tech University — In this work, we present the results of the KWW and BSW[1] descriptions of the dynamic data for a colloid and a polymer (PVAc) in their respective glass transition regions. It was found that the KWW function is not able to describe the dynamic data for the colloidal system, while BSW function, provides an acceptable description to the dynamic response of the polymer. The fitting parameters n_e and n_g in the BSW function, which indicate the slopes of the relaxation spectrum, remain constant at different temperatures consistent with the validity of the time-temperature superposition principle. We also used the G_g obtained from the KWW and BSW functions, where appropriate, to evaluate the Dyre shoving model.[2] Here, as is the case for small molecule glass formers, we found the temperature dependences of the G_g highly sensitive to the model chosen to describe the experimental data. This suggests that evaluation of the shoving model requires very broad frequency and temperature experiments beyond those normally performed in dynamic rheometry.

[1]M. Baumgärtel, A. Schausberger, H.H. Winter, Rheol. Acta. 29:400–408 (1990).
[2]J. C. Dyre, N. B. Olsen, T. Christensen, Physical Review B.53, 5 (1996).

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