

Critical Phenomena in an Eight-Arm Polystyrene in Methylcyclohexane

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The coexistence curve and turbidity of eight-arm polystyrene in methylcyclohexane has been measured and used to determine various amplitudes. The turbidity in this system was determined from the measured ratio of the transmitted to incident light intensities over several decades in reduced temperature. Using Ornstein-Zernike theory, we are able to fit the turbidity data for one sample and determine that the correlation length amplitude is 0.604 - 0.010 nm when this branched polystyrene has a total molecular weight of 74,000. The coexistence curve for different molecular weight, eight-arm polystyrene in the same solvent is being determined by measuring the refractive index in each phase when within two degrees of the critical temperature. The amplitude of the coexistence curve and the correlation length are being determined for different molecular weight, eight-arm polystyrene in methylcyclohexane samples. The amplitudes should obey scaling relations that are independent of molecular weight, which will be tested with our data. These amplitudes are also compared to the literature values for a linear polystyrene in methylcyclohexane for various molecular weights.

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