

## Thermodiffusion Measurements in a Critical Binary Mixture

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The so-called thermal diffusion forced Rayleigh scattering technique (TDFRS), a holographic grating technique, has been successfully applied to measure Soret coefficient in binary mixtures. In the experiment a transient thermal grating is written into a slightly absorbing solution. The rise and decay of the temperature-induced concentration grating are probed by a readout laser beam. The holographic grating technique has two advantages compared to the thermal diffusion cell and gravitational column. First, the relaxation times are short due to narrow spacing of the interference grating and secondly, relatively large temperature gradients can be achieved with small temperature differences. This way the system can be kept close to thermal equilibrium. For these reason we applied this technique to study the asymptotic behavior of the Soret coefficient in the critical mixture anilin in cyclohexane. Theoretically, the Soret coefficient diverges according to the asymptotic power law  $S_T \propto (T - T_c)^{-\nu(1+\chi)} = (T - T_c)^{-0.67}$ . The first measurements on the critical mixture anilin in cyclohexane in the vicinity of the critical point are in good agreement with the theoretical prediction. Special attention has been given to the stability of the system and the necessary modification of the TDFRS setup to study a critical mixture.