A Simple Procedure for The Determination of Refractive Indices of Liquid Crystals from High-Resolution Birefringence Measurements E. KUTLU, H. OZBEK, S. USTUNEL, M. CETINKAYA, ITU — We present a simple procedure to determine the temperature dependence of the extraordinary and ordinary refractive indices of liquid crystals based on the high precision birefringence measurements. We show that the procedure needs only a single value for refractive index, namely n_I being the value of the refractive index in the isotropic phase just above the nematic-isotropic (NI) transition temperature apart from the birefringence. In most studies the calculation of the order parameter is based on the Haller approximation known to be inconsistent with the weakly first-order character of the N-I transition and to lead systematically lower values for the critical exponent. Here, we revisit the methodology for the determination of the orientational order parameter in the N phase We have calculated the order parameter by applying Vuks and Neugebauer models and the procedure by Kuczynski *et al.* We conclude that the approximation for the average refractive index $<n> \approx n_I^2$ is plausible to determine the temperature dependence of the refractive indices together with the birefringence data. This procedure allows one to obtain the normalised polarizabilities of the extraordinary and ordinary rays without addressing density measurements.

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