Critical behavior at the isotropic to nematic phase transition in a bent-core liquid crystal DAVID WIANT, STRAHINJA STOJADINOVIC, KRISHNA NEUPANE, SUNIL SHARMA, Physics Dept. Kent State U., KATALIN FODOR-CSORBA, Hungarian Research Institute for Solid State Physics and Optics, ANTAL JAKLI, Liquid Crystal Institute Kent State U., JAMES GLEESON, SAMUEL SPRUNT, Physics Dept. Kent State U. — Magnetic birefringence and dynamic light scattering measurements of orientational order parameter fluctuations at the isotropic- nematic phase transition of a bent-core liquid crystal reveal a pre-transitional temperature dependence consistent with the standard Landau-deGennes mean field theory. However, the transition in the bent-core compound is more weakly first-order ($T_{NI} - T^* \approx 0.4^\circ$C), the leading Landau coefficient is $\sim 10$ times lower, and the viscosity associated with nematic order fluctuations is $\sim 50$ times higher, than typically observed in calamitic (rod- shaped) liquid crystals. These anomalies can be explained by an unconventional optically isotropic phase composed of complexes of bent-core molecules. Also, we will present preliminary magnetic birefringence and density measurements at temperatures above the nematic-isotropic transition which support the existence of an optically isotropic state.

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