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Low electric field induced phase transition of the B1 bent-core liquid crystal phase to a switching phase J. KIRCHHOFF, L.S. HIRST, Florida State University — Liquid crystal materials that have ferroelectric and antiferroelectric phases are useful in applications due to their switching properties. The B1 bent-core liquid crystal phase is a columnar phase that does not exhibit switching. A transition from the B1 liquid crystal phase to a switching phase has been seen at an electric field of 10 V/μm, which is much lower than previously seen fields of greater than 25 V/μm [1]. This transition is irreversible upon reduction of the applied field and switching continues almost threshold-less down to an applied field of 40 mV/μm, which has not been previously reported. Any amount of a chiral rod-like dopant increases the field required to transition from the B1 to the switching phase, and the transition becomes reversible with the mixture relaxing back to the B1 phase after a decrease in the electric field. A small concentration of the rod-like dopant also induces a change from the B1 phase to a new liquid crystal phase. These effects were studied using polarized optical microscopy, calorimetry (DSC), and x-ray measurements.
[1] J. Ortega et. al., Phys. Rev. E, **69**, 011703 (2004)

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