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**Piezoelectric properties of polymers containing bent-shape liquid crystal molecules**[1] N. DIORIO, M. VARGA, Kent State University, A. CARIF, J.E. PUSKAS, University of Akron, K. FODOR-CSORBA, Hungarian Academy of Sciences, S. SPRUNT, J.T. GLEESON, A. JAKLI, Kent State University — Recently, bent-core liquid crystal elastomers have shown to exhibit large values of flexoelectricity as many as 3 orders of magnitude larger than liquid crystal elastomers containing rod-shaped molecules. These unusual high responses are attributed to have piezoelectric origin. Motivated by this, in this study, two bent-core liquid crystals were used to make various types of materials; low molecular weight bent-core nematic fluid, side chain bent-core liquid crystal polymer, low molecular liquid crystal dispersed in a polyisobutylene-based thermoplastic elastomer, and side-chain bent-core elastomers. Liquid crystal elastomers combine elasticity and flexibility inherent to rubbers and the optical and electrical properties of liquid crystals, and are promising materials for applications such as electro-optics, flexible electronics and actuator technologies for biomedical applications. Most conventional liquid crystal elastomers have rod-shaped liquid crystal molecules chemically attached to a crosslinked polymer network. Converse piezoelectric responses were measured by a Mirau interferometer and the direct piezoelectric signals were studied by home-made device where the stress is provided by an audio speaker. The results will be analyzed in terms of ferroelectric clusters of the materials in the nematic phase and will be compared with other piezoelectric materials.

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