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Large Flow-Birefringence of Nematogenic Bent-Core Liquid Crystals CHRISTOPHER BAILEY, Kent State University, KATALIN FODOR-CSORBA, Research Institute for solid state physics and optics, Budapest, Hungary, RAFAEL VERDUZCO, Oak Ridge National Laboratory, JAMES GLEESON, SAMUEL SPRUNT, ANTAL JAKLI, Kent State University — We have found that bent-core liquid crystalline materials show exceptionally large flow birefringence in their isotropic liquid phase. The flow birefringence is over two orders of magnitude larger than usual for low molecular weight liquid crystals. Comparing the flow birefringence per unit viscosity, the observed values are an order of magnitude larger than low molecular weight and side-chain polymeric calamitic liquid crystals. This large flow birefringence is attributed to the nanostructure of these materials that contain temporary smectic clusters of a few smectic layers, which exist even in their isotropic phase. These smectic clusters appear to shear align resulting in the observed flow birefringence behavior.

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