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Chirality Amplification in Tactoids of Lyotropic Chromonic Liquid Crystals CHENHUI PENG, OLEG LAVRENTOVICH, Liquid Crystal Institute and Chemical Physics Interdisciplinary Program, Kent State University, Kent, Ohio 44242 — We demonstrate an effective chirality amplification based on the long-range forces, extending over the scales of tens of micrometers, much larger than the single molecule (nanometer) scale. The mechanism is rooted in the long-range elastic nature of orientational order in lyotropic chromonic liquid crystals (LCLCs) that represent water solutions of achiral disc-like molecules. Minute quantities of chiral molecules such as amino acid L-alanine and limonene added to the droplets of LCLC lead to chiral amplification characterized by an increase of optical activity by a factor of 10^3 – 10^4. This effect allows one to discriminate and detect the absolute configuration of chiral molecules in an aqueous system, thus opening new possibilities in biosensing and other biological applications.

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