

Abstract Submitted
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The Origin of Helical Suprastructure from Achiral 4-Biphenyl Carboxylic Acid Molecules KWANG-UN JEONG, Maurice Morton Institute and Department of Polymer Science, The University of Akron, Akron, Ohio 44325-3909, JASON J. GE, SHI JIN, MATTHEW J. GRAHAM, BRIAN S. KNAPP, FRANK W. HARRIS, STEPHEN Z. D. CHENG — A novel series of achiral 4-biphenyl carboxylic acid molecules (BPCA-C_n-PmOH) connected with phenol at meta-position by alkoxy chains with various carbon numbers ($n = 6-10$) formed spontaneous helical suprastructures in the low ordered SmC phase. In order to understand the origin of phase chirality without configurational chirality in BPCA-C_n-PmOH, four other achiral 4-biphenyl carbonyl model compounds with an alkoxy chain ($n = 6$) were studied using a combination of techniques. It is concluded that both the twisted conformation of the self-assembled head-to-head dimers and the phenyl groups at the end of the dimers are essential to form a stable helical suprastructure, but the -OH or -OCH₃ functions at the meta- or para-position of phenyl ring is not necessary.

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