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Electron density distribution of symmetric liquid crystal dimer linked by flexible alkyl chain[1] DENA MAE AGRA-KOOIJMAN, MICHAEL FISCH, Kent State University, Kent, OH, GAUTAM SINGH, Amity University, Noida, India, MUTHUKUMARASWAMY VENGATESAN, JANGKUN SONG, Sungkyunkwan University, Suwon, Republic of Korea, SATYENDRA KUMAR, University at Albany, Albany, NY — The results of x-ray scattering study combined with electron density distribution of a symmetric liquid crystal dimer linked by flexible chains, specifically 1",7"-bis(4-cyanobiphenyl-4'-yl) heptane (CB7CB) provide compelling new insights into the molecular organization in the nematic (N) and twist-bend nematic (N_{TB}) phases. The electron density (ρ) of the liquid crystal molecule has customarily been assumed to be uniform rather than a function of distance, ρ(z) along the molecular axis. We introduce a functional model of the electron density using Gaussian distribution for different parts of the molecule. The observed diffraction peak at $d \sim 0.41L$ (L, molecular length) expected to appear at $d \sim L$, is found to primarily arise from the form factor, F(q) = $|f(q)|^2$ where $f(q)$ is the Fourier transform of ρ(z). Modeling the functional form of ρ(z) was verified in the N phase of different rod-like molecules, with and without intercalation. The results further suggest that there is no intercalation of the dimer molecules in the N and N_{TB} phases.

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