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Submolecular organization of de Vries smectics with tuned frustration between SmA- and SmC- promoting elements¹ DENA MAE AGRA-KOOIJMAN, S DEY, Kent State University, Q. SONG, Queens University, Canada, D. NONNENMACHER, F. GIESSELMANN, Universität Stuttgart, Germany, R. LEMIEUX, Queens University, Canada, SATYENDRA KUMAR, Kent State University — Structure-property relationships and the SmA-SmC (AC) transition were investigated with x-ray diffraction in de Vries smectics compounds with tuned frustration between SmA and SmC promoting elements in the molecules. These are isometric analogues of a compound with a 2-phenylpyrimidine core that combines a trisiloxane-terminated alkoxy side-chain with a chloro-terminated alkoxy side-chain. The results reveal the local molecular structure in which, both siloxane and hydrocarbon segments are segregated and oriented parallel to the director in the SmA phase. But the siloxane segments oriented at an angle ($\sim 14^\circ$) different from the remaining hydrocarbon part of the molecule. This provides the first direct evidence of a kinked molecular conformation and nano-segregation of the molecule in the SmC phase. The two parts of the molecule possess different orientational order, siloxane part being more disordered, in both phases. The rate of change of the tilt angle with temperature appears to be different in the three compounds investigated.

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