

Abstract Submitted
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Homeotropic alignment of the lyotropic chromonic liquid crystal Sunset Yellow FCF using pi-pi stacking chemical interactions¹ JOONWOO JEONG, GANGHEE HAN, A.T. CHARLIE JOHNSON, TOM C. LUBENSKY, PETER J. COLLINGS², A.G. YODH, Department of Physics & Astronomy, University of Pennsylvania, Philadelphia, PA 19104, USA — We report on the homeotropic alignment of the lyotropic chromonic liquid crystal, Sunset Yellow FCF (SSY), using pi-pi stacking interactions between the SSY molecules and (1) thin parylene films or (2) a graphene monolayer. The nematic and columnar phases of SSY molecules arise via self-assembly in water into stacks through non-covalent attractions between the SSY molecules. Interestingly, we find that the same non-covalent interactions between SSY molecules and a parylene or graphene alignment layer lead to homeotropic anchoring of these stacks. The nematic phase of SSY is introduced between two glass substrates coated with parylene films or graphene monolayers, and homeotropic alignment of SSY is confirmed by polarized optical microscopy and conoscopy. Additionally, we observe and can explain the stripe domains that occur during cooling of the sample in this cell, and we consider possible novel applications for homeotropically aligned chromonic liquid crystals.

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