Structural study of guest-host complex of reactive mesogen for negative dispersion of birefringence

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The small display industry, which has grown along with the explosive growth of the smart device field, heavily relies on the success the compensation film in the panel. Since the compensation film make the phase of incident light to be constant regardless of wavelength in visible light range to prevent the reflection of light, the compensation film should have negative dispersion (ND) of birefringence. In that case, the birefringence increases as the wavelength of the light increases. In this study, when two kinds of molecules (i.e., HCM026 and X2RM) containing a mesogenic group with significantly different wavelength dispersion are arranged in different orientation in a film structure, it was theoretically shown that the film exhibits ND. Furthermore, through the coarse-grained molecular dynamics, it was demonstrated that the smectic phase of HCM026 played a role as a template inducing the structure, in which mesogenic groups of the two molecules intersect in the perpendicular direction and induce the ND of the film. The structural studies are expected to contribute to the fabrication of thin single-layered ND compensation films with flexibility.