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Abstract: Deuterium NMR was used to investigate the orientational order in a composite cellulosic formed by liquid crystalline acetoxypolycellulose (A PC) and demented nematic 4'-penty1-4-cyanobiphenyl (5CB-4 alpha d(2)) with the per centage of 85% A PC by weight Three forms of the composite including electro spun microfibers, thin film and bulk samples were analyzed The NMR results initially suggest two distinct scenarios, one whet e the 503-alpha d(2), is confined to small droplets with dimensions smaller than the magnetic coherence length and the other where the 503-alpha d(2) molecules arc aligned with the A PC network chains Polarized optical microscopy (POW from thin film samples along with all the NMR results show the presence of 5CB-alpha d(2) droplets in the composite systems with a nematic wetting layer at the APC-5CB-alpha d(2) interface that experiences and order disorder transition driven by the polymer network N-I transition The characterization of the APC network I-N transition shows a pronounced subcritical behavior within a heterogeneity scenario

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