

Supplementary Information

Plant-Derived Cellulose Nanocrystals as Pre-alignment Layer for Ferroelectric Mesogens in Display Applications

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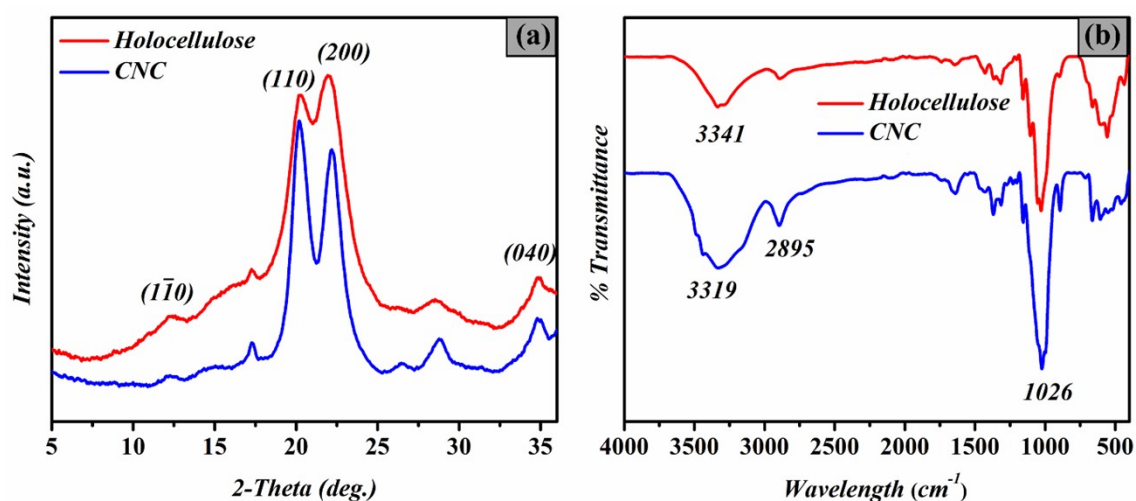


Figure S1. (a) WAXS pattern and (b) FTIR spectra of CNC.

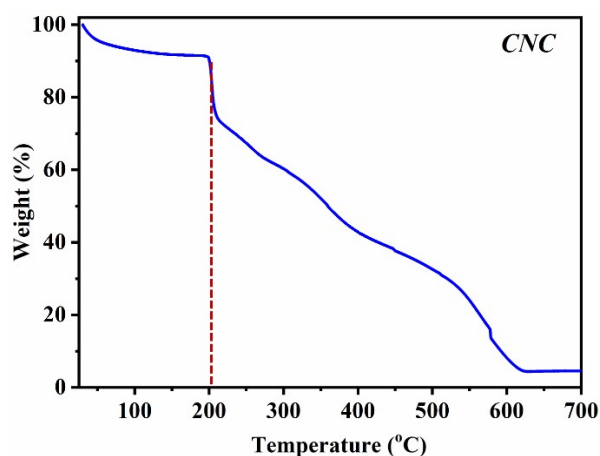


Figure S2. Thermogravimetric analysis of CNC films.

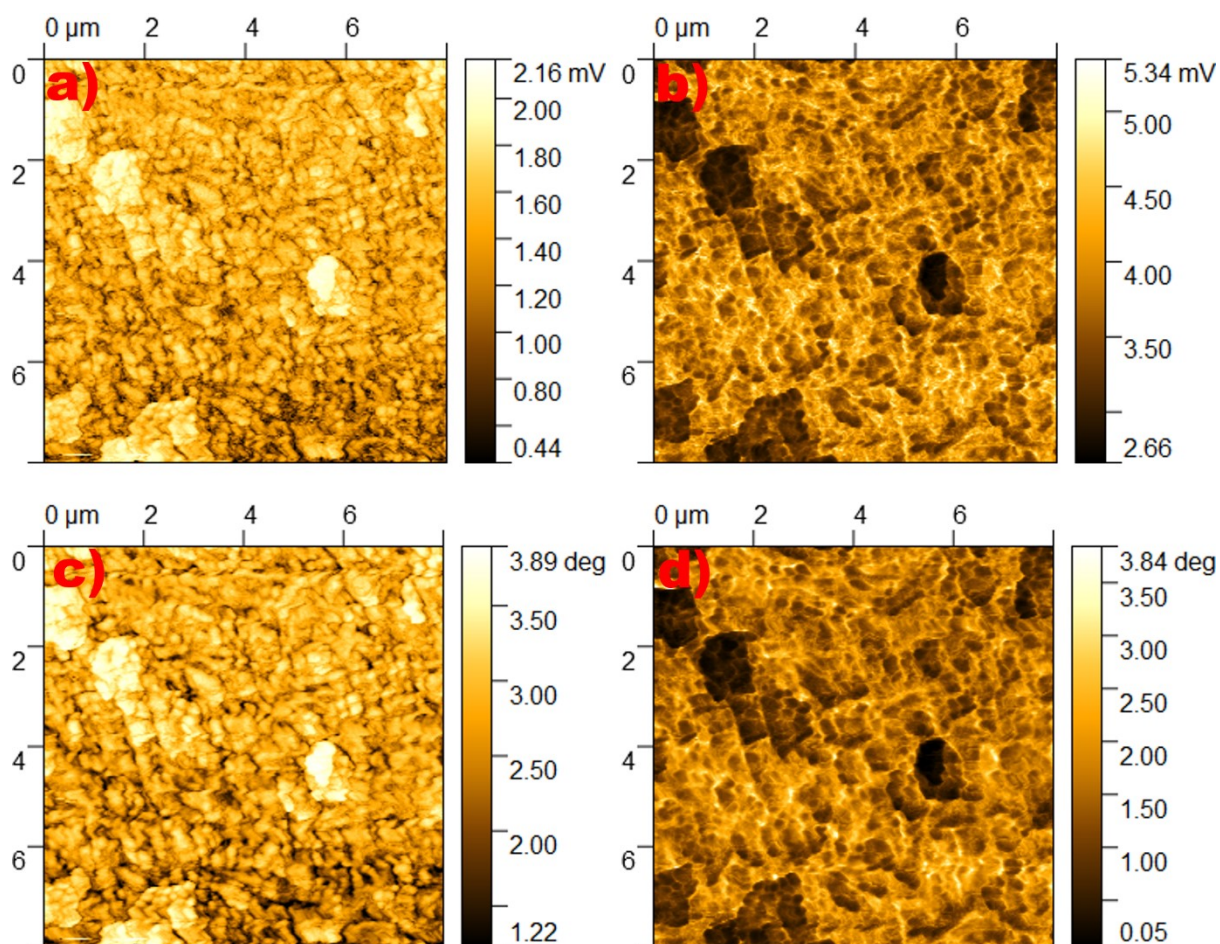


Figure S3. PFM images of CNC film; a) amplitude with -3V, b) amplitude with +3V, c) phase with -3V, d) phase with +3V.

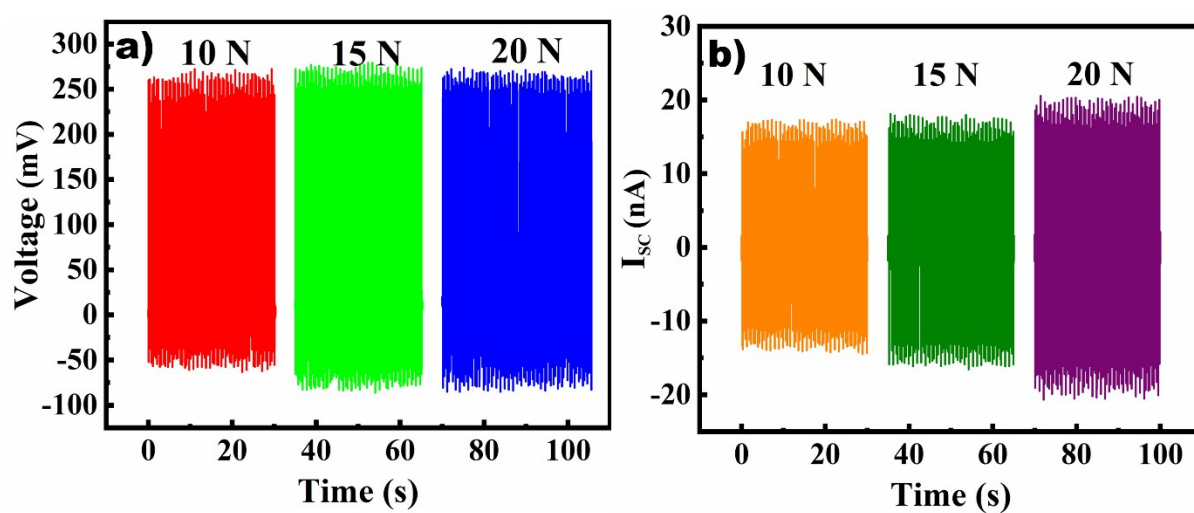


Figure S4. Output characteristics of PENG with different applied forces at 4 Hz; a) Open circuit voltage, and b) short circuit current.

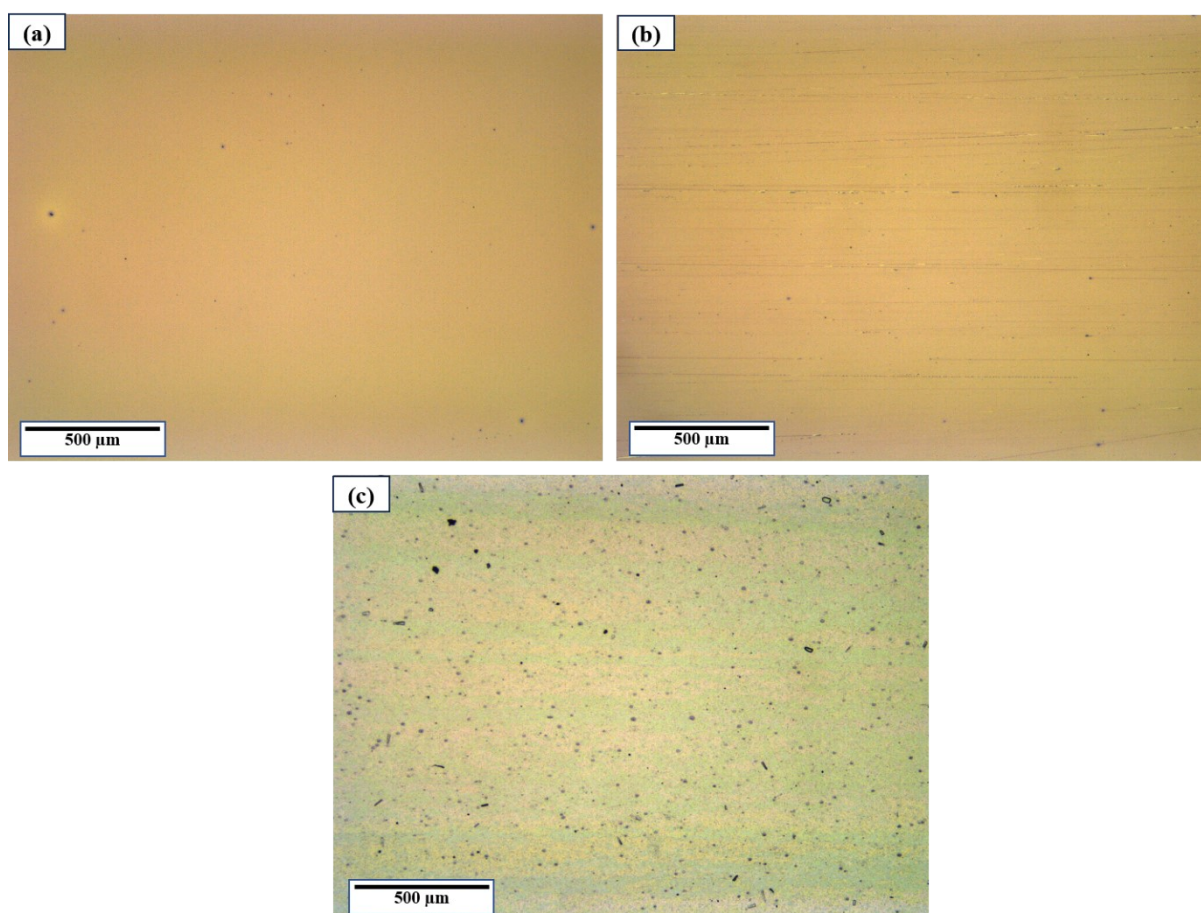


Figure S5. The optical micrographs of alignment layers through polarizing optical microscope in reflection mode without polarizers; (a) Nylon layer without rubbing (b) Nylon layer with rubbing (c) CNC alignment layer.

| Sample | Thickness of alignment layer (μm) |
|--------------------|--|
| CNC ₁₀₀ | 0.9 |
| CNC ₁₅₀ | 1.185 |
| CNC ₂₀₀ | 1.515 |
| CNC ₂₅₀ | 1.803 |
| CNC ₃₀₀ | 2.125 |

Table S1. Thickness of CNC coatings on ITO substrates.

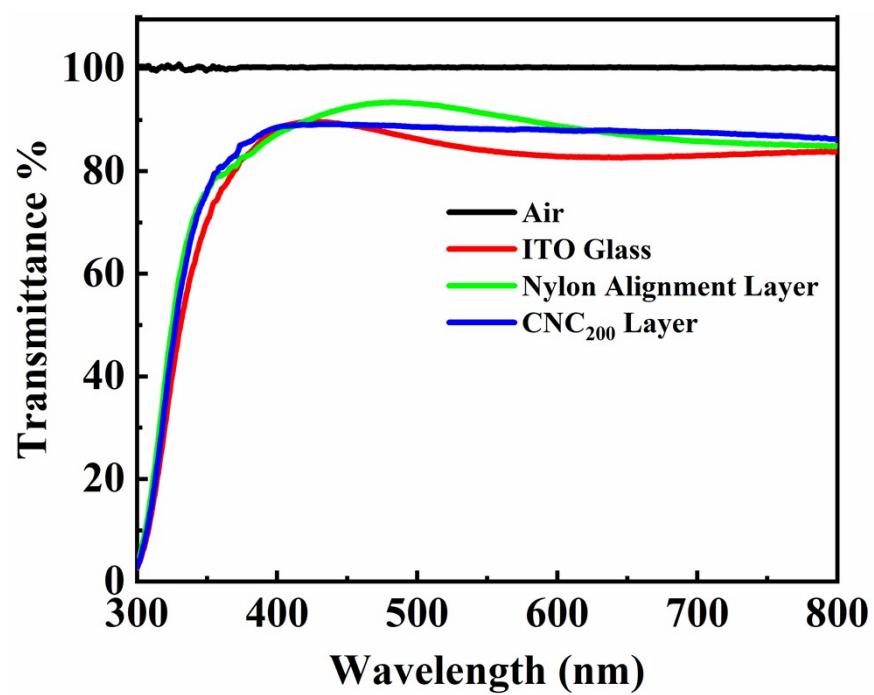


Figure S6. Optical transmittance of different alignment layers before LC cell fabrication.