Chirality-Enabled Liquid Crystalline Physical Gels with High Modulus but Low Driving Voltage

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2.7. Circular Dichroism.

racemate. Only a suspension is obtained with the racemate. The result indicates the importance of chirality to enable a remarkable gelation capability, as reported previously.[59] Notably, it is a different story in hydrogels. The same racemate composed of 1,4-benzenedicarboxamide phenylalanine derivatives is able to form hydrogels.[10] It is easy to understand that, in a hydrogel, both water and gelators participate in the physical network via intermolecular hydrogen-bonding.[16] Neither LPF nor DPF generates hydrogen bonding with the hydrophobic 5CB.[31]

3.2. Chirality of LPF and DPF Gels. To get a deeper understanding on the chirality of LC gels, CD characterization was conducted. As displayed in Figure 2a, both LPF and DPF dissolved in ethanol exhibit clear CD signals, indicating remarkable chirality. The LPF molecules show positive peak absorption at 219 nm, whereas negative peak absorption at 243 nm. By contrast, the DPF molecules show similar peak absorptions at the same wavelengths, but in opposite directions. The negative and positive Cotton effects for LPF and DPF, respectively, are supposed to be induced by the stacking of phenyl chromophores.[59] Interestingly, a red shift of ∼100 nm on the peak absorptions is noted when LC gels are

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