Effect of ionic strength on shear-thinning nanoclay-polymer composite hydrogels

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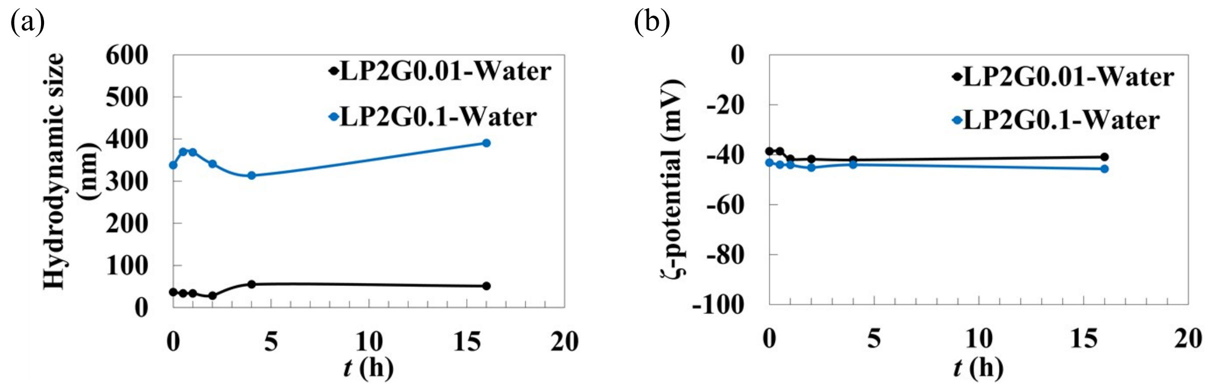

Figure S1. *Dynamic light scattering* ***(****DLS) and electrokinetic analyses of LAPONITE®-gelatin (LP-G) suspensions, yielding hydrodynamic size (****a****) and ζ-potential (****b****). At a constant gelatin concentration, increasing LAPONITE® concentration (e.g., 2% compared to 1%, Figure* ***1c****), increases the hydrodynamic size of LAPONITE®-gelatin particles as a result of polymer-mediated nanoplatelet bridging. The stable size of particles suggests that the gelatin-stabilized LAPONITE® clusters form a stable colloidal suspension.*

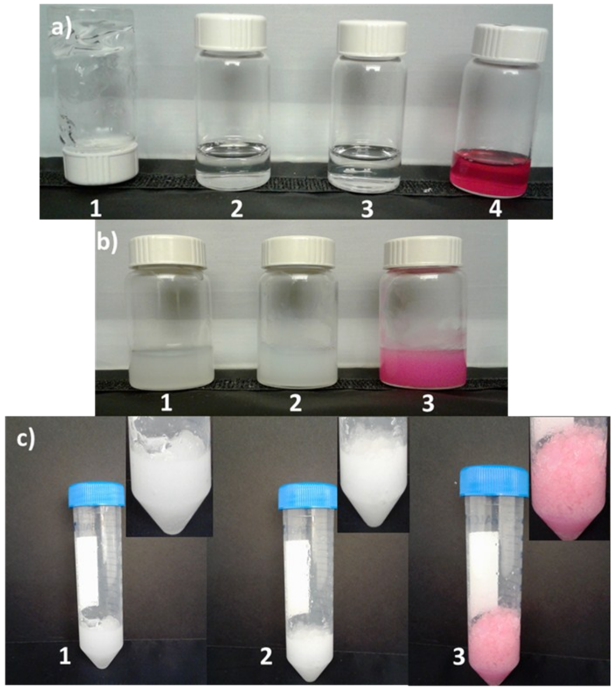

Figure S2. *Images of LAPONITE®, gelatin, and different compositions of LAPONITE®-gelatin mixtures. (**a-1**) LAPONITE® (6 wt%) in Milli-Q water, (**a-2**) Gelatin (2 wt%) in Milli-Q water, (**a-3**) Gelatin (2 wt%) in PBS, (**a-4**) Gelatin (2 wt%) in DMEM. STBs prepared by mixing (**b-1**) LAPONITE® (6 wt%) in Milli-Q water and gelatin (2 wt%) in Milli-Q water, (**b-2**): LAPONITE® (6 wt%) in Milli-Q water and gelatin (2 wt%) in PBS, and (**b-3**) LAPONITE® (6 wt%) in Milli-Q water and gelatin (2 wt%) in DMEM. STBs prepared by mixing (**c-1**) LAPONITE® (12 wt%) in Milli-Q water and gelatin (6 wt%) in Milli-Q water (1:1), (**c-2**) LAPONITE® (12 wt%) in Milli-Q water and gelatin (6 wt%) in PBS, and (**c-3**) LAPONITE® (12 wt%) in Milli-Q water and gelatin (6 wt%) in DMEM.*

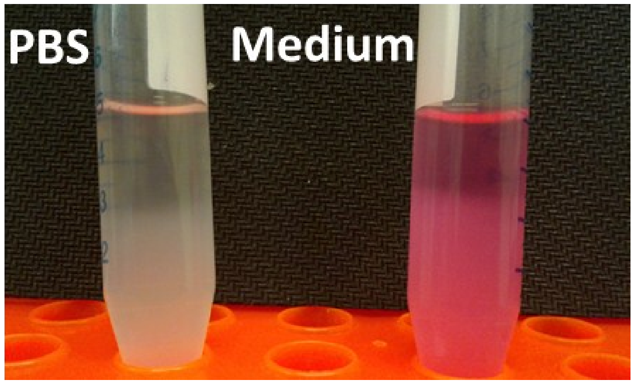

Figure S3. *Images of nanocomposites prepared by mixing (1:1 v/v) water-dispersed LAPONITE® (2 wt%) with gelatin (0.1 wt% in PBS or DMEM). The dispersions undergo phase separation.*

LAPONITE®, *T*=37°C

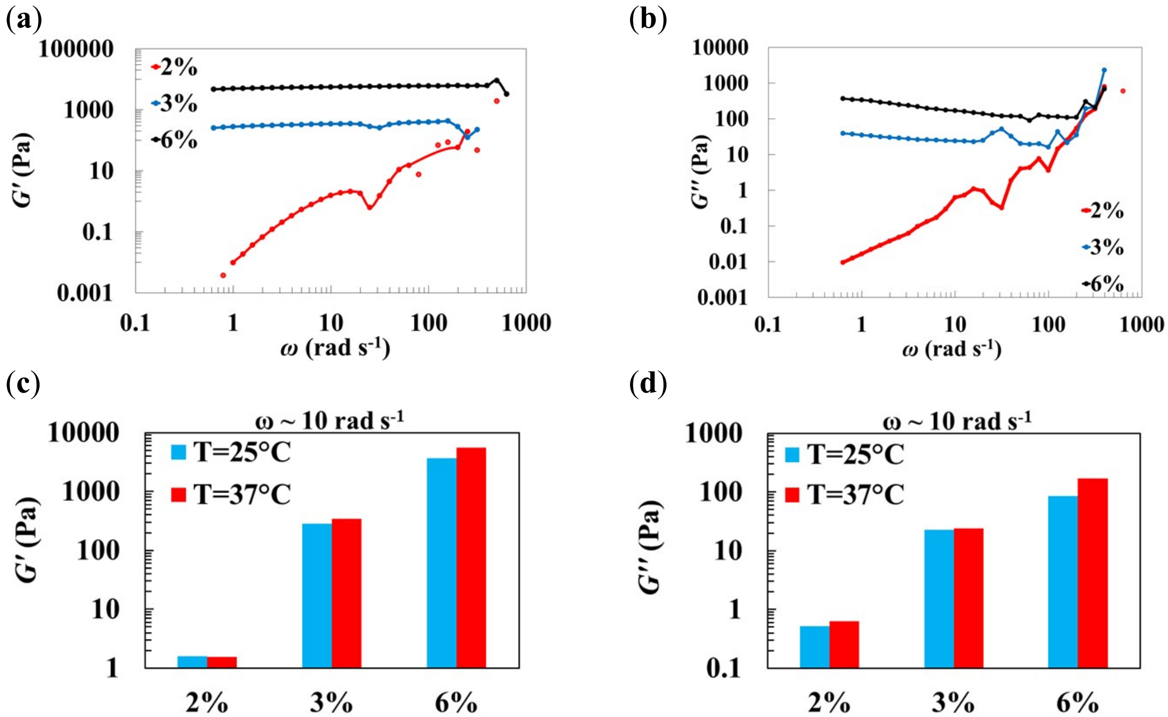

Figure S4. *Rheological properties of LAPONITE® dispersions/gels at T = 37°C, prepared in Milli-Q water. Storage moduli (**a**), and loss moduli (**b**) versus angular frequency. Increasing LAPONITE® concentration increases the viscoelastic moduli. Effect of temperature and LAPONITE® concentration on the storage (at ω ~ 10 rad s^{-1}, **c**) and loss (at ω ~ 10 rad s^{-1}, **d**) moduli of LAPONITE® dispersions/gels.*

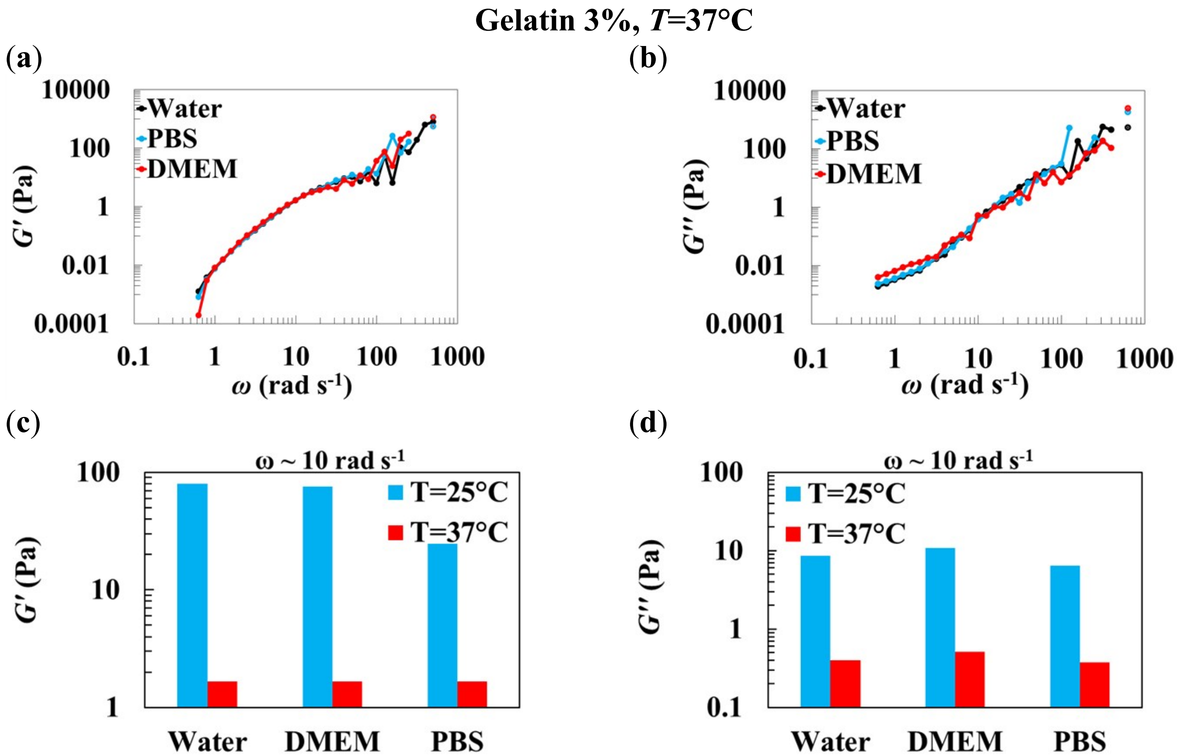

Figure S5. *Rheological properties of gelatin solutions at T = 37 °C, prepared in Milli-Q water, PBS, and media. Storage moduli (**a**), and loss moduli (**b**) versus angular frequency. Effect of temperature and media on the storage moduli (at ω ~ 10 rad s*$^{-1}$*, **c**) and loss moduli (at ω ~ 10 rad s*$^{-1}$*, **d**) of gelatin solutions.*

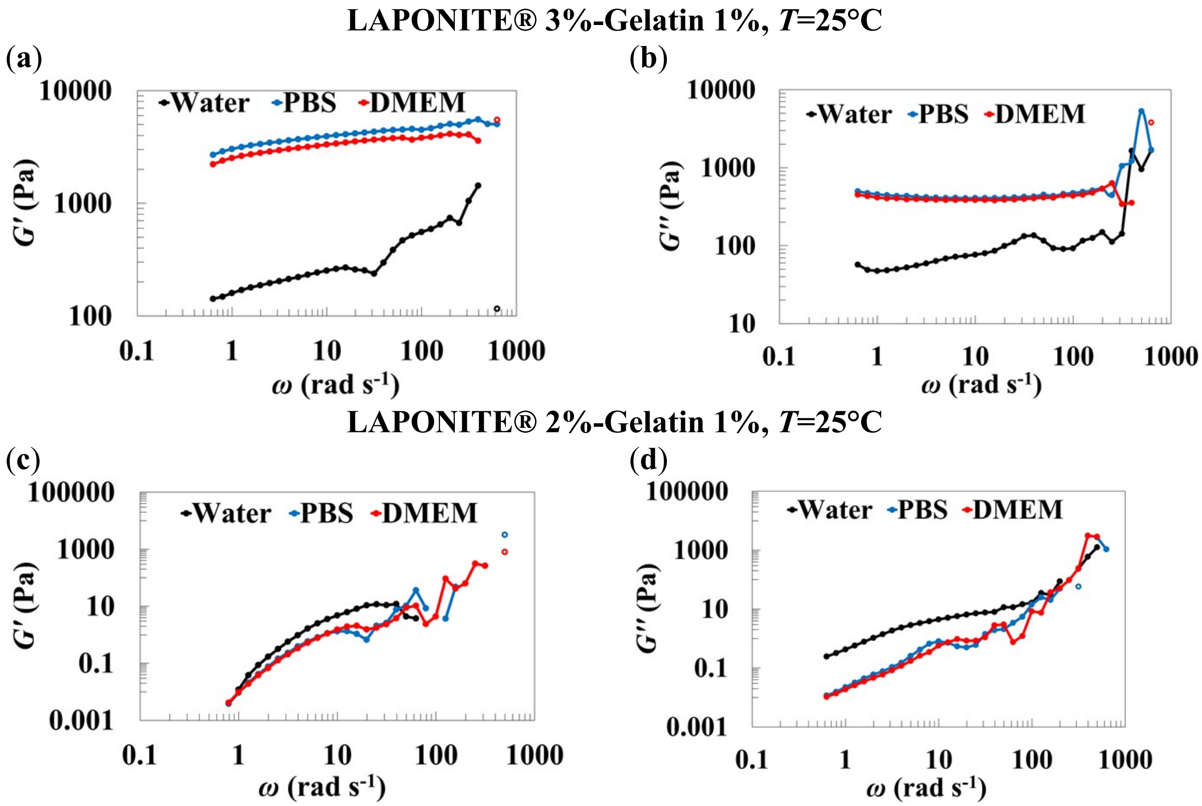

Figure S6. *Rheological properties of LAPONITE®-gelatin (1%) shear-thinning hydrogels prepared by mixing exfoliated LAPONITE® with gelatin dissolved in Milli-Q water, PBS, and DMEM at 25°C. Storage* ***(a,c)*** *and loss moduli* ***(b,d)*** *versus angular frequency.*

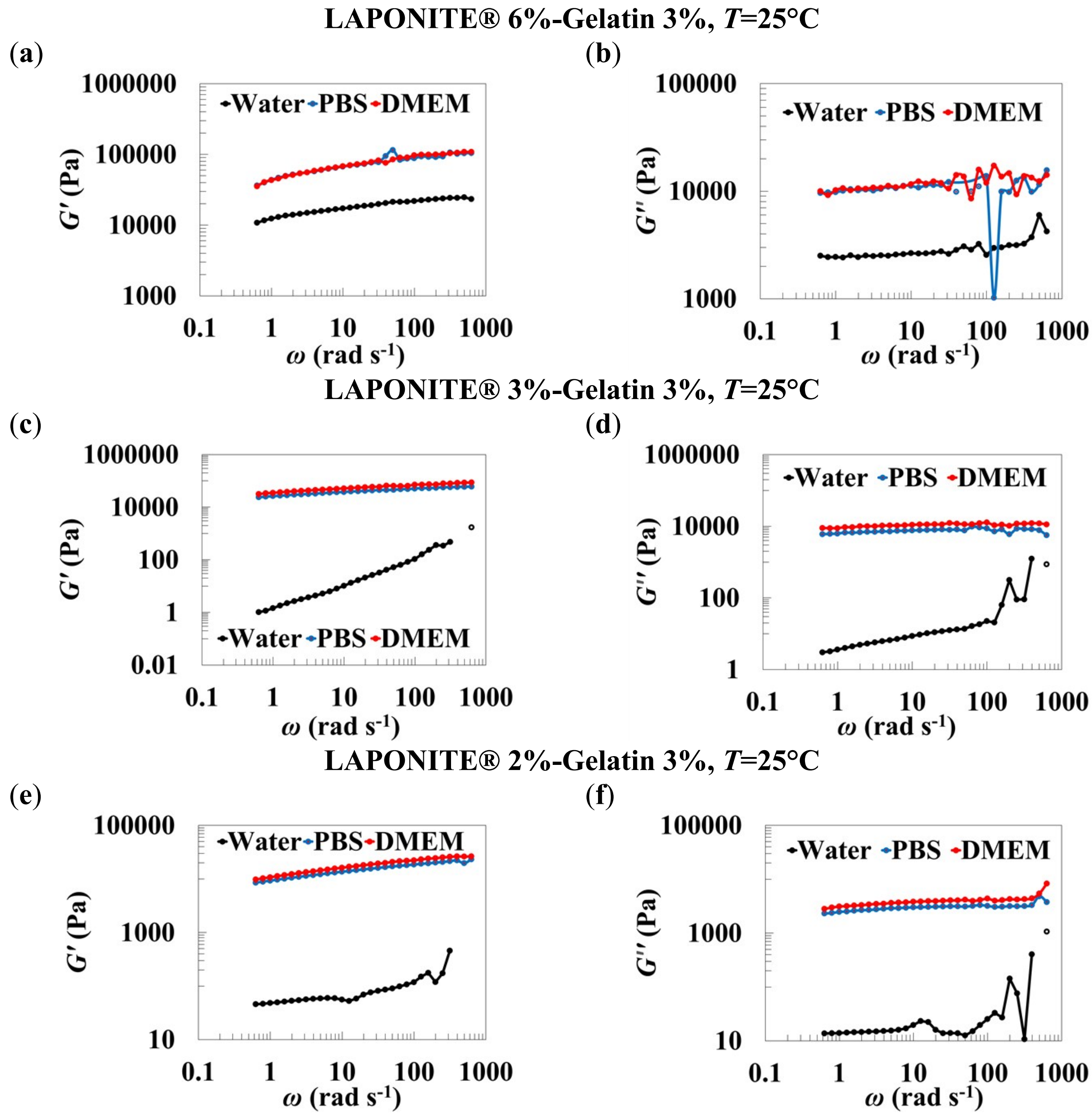

Figure S7. *Rheological properties of LAPONITE®-gelatin (3%) shear-thinning hydrogels prepared by mixing exfoliated LAPONITE® with gelatin dissolved in Milli-Q water, PBS, and DMEM at 25°C. Storage (**a**,**c**,**e**) and loss moduli (**b**,**d**,**f**) versus angular frequency.*

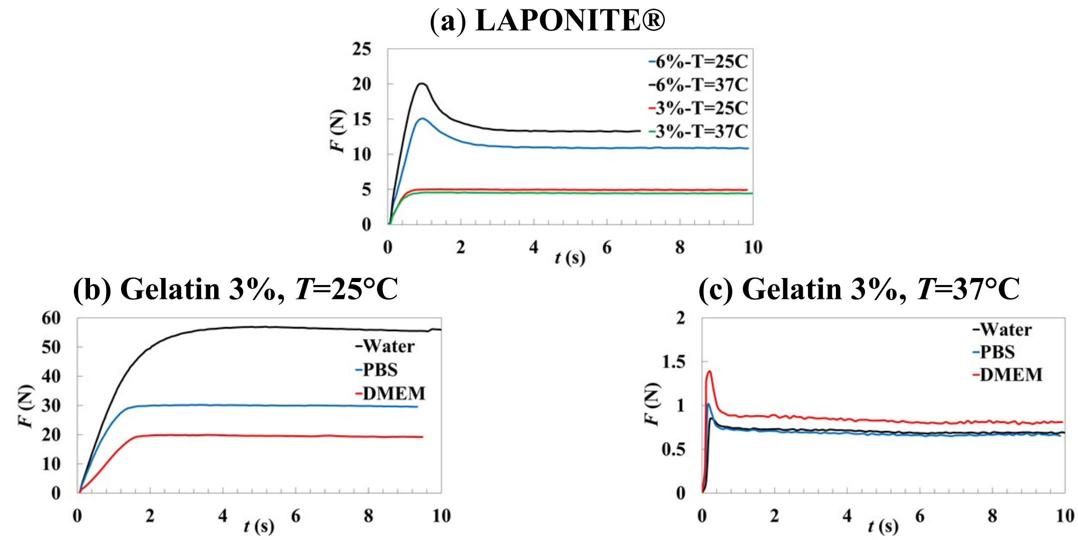

Figure S8. *Dynamics of injection force through the 5F catheter for LAPONITE® (**a**) and gelatin (**b**,**c**). The higher the LAPONITE® concentration, the higher the injection force, regardless of temperature. Gelatin, a heat-sensitive biopolymer, undergoes phase transition at room temperature, resulting in an increase in the injection force.*

Movies *showing the injection of LAPONITE®-gelatin STBs prepared in water (**M1**), PBS (**M2**), and DMEM (**M3**) through a 3 mL Luer lock syringe, equipped with a 23 G needle (BD Precision Glide 23G×1" thin wall M, with L = 38 mm and ID = 0.34 mm). Phase separation was observed in PBS and DMEM.*