Tuneable Mechanical Properties in Low Molecular Weight Gels

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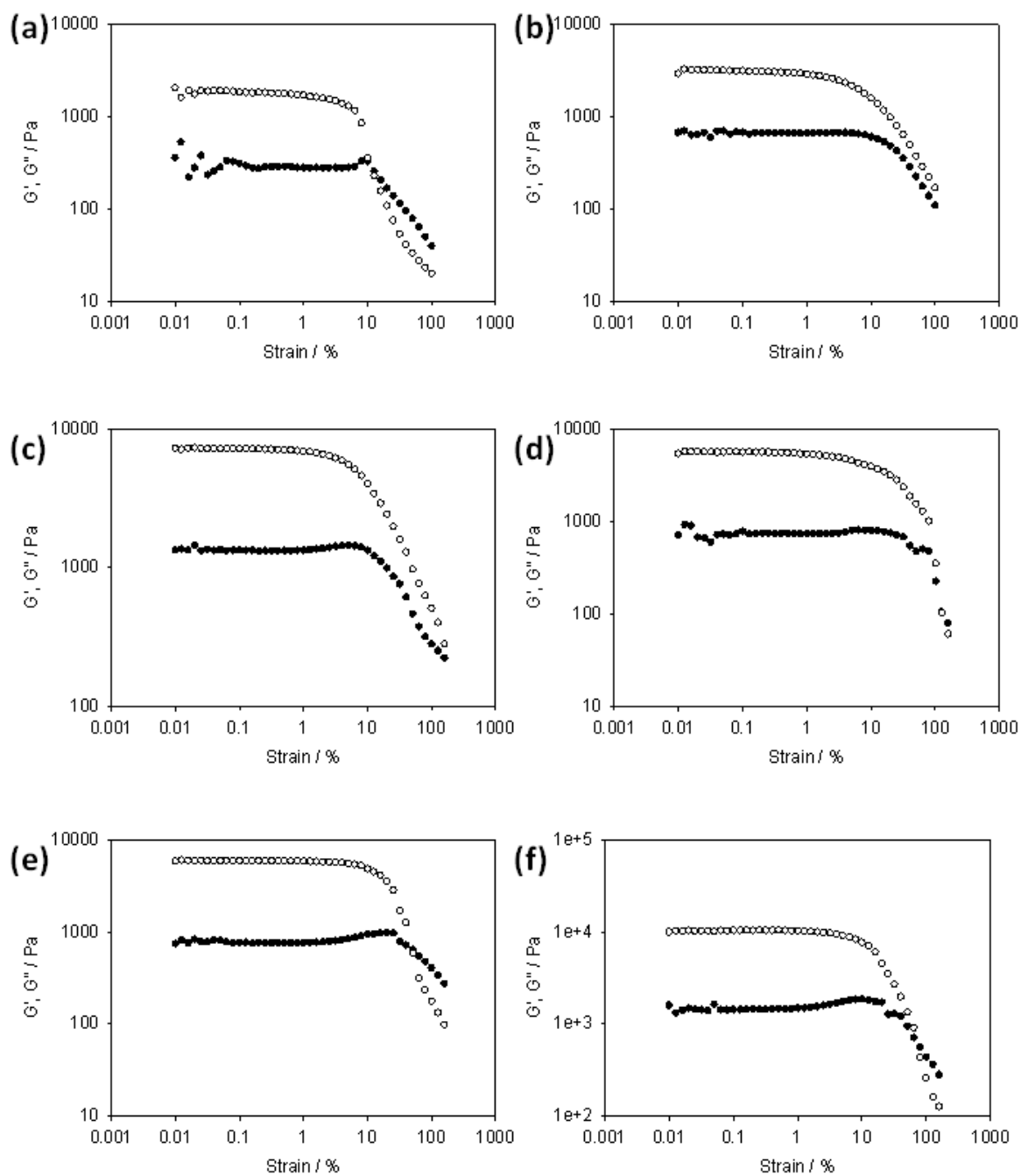Email: d.j.adams@liverpool.ac.uk

SUPPORTING INFORMATION

Figure S1. Strain sweeps for gels prepared using FmocLG (5 mg/mL final concentration) at different volume fractions of DMSO (a) 0.50, (b) 0.40, (c) 0.30, (d) 0.20, (e) 0.10 and (f) 0.05. For all of the above, ○, G′; ●, G″.
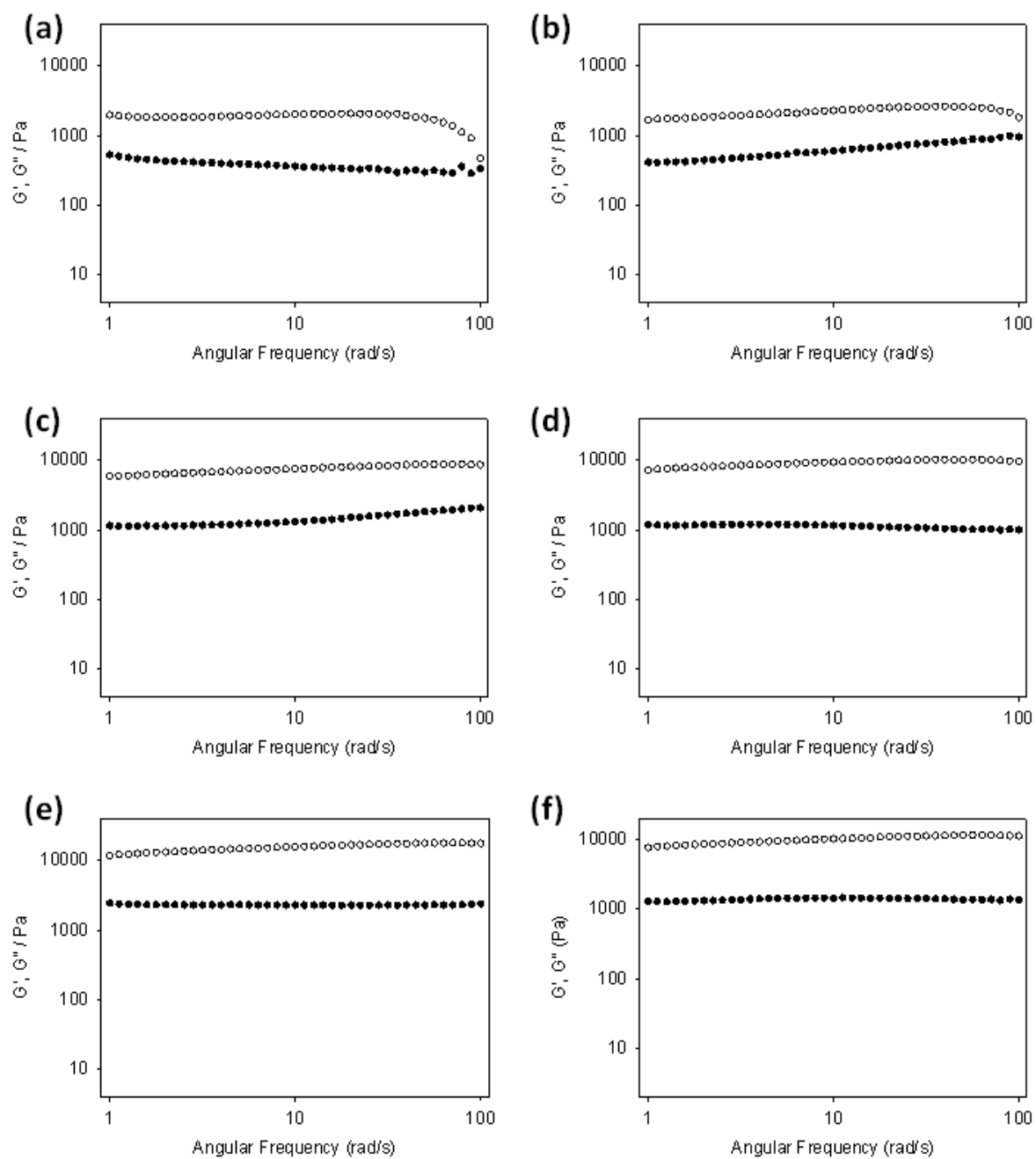
Figure S2. Frequency dependence of the moduli for gels prepared using FmocLG (5 mg/mL final concentration) at different volume fractions of DMSO (a) 0.50, (b) 0.40, (c) 0.30, (d) 0.20, (e) 0.10 and (f) 0.05. For all of the above, ○, G′; ●, G″.

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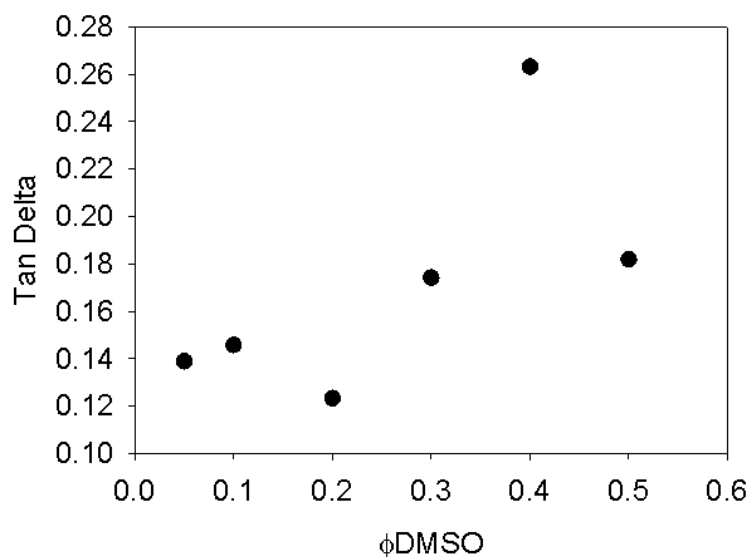**Figure S3.** Tanδ (i.e. ratio of G″ to G′) at an angular frequency of 10 rad/s for gels prepared using FmocLG (5 mg/mL final concentration) at different Φ_{DMSO}.
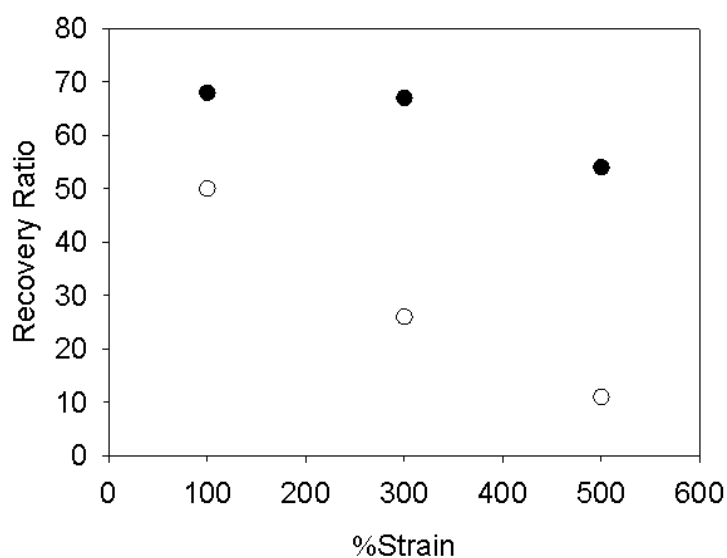

Figure S4. Recovery ratio for of Φ_{DMSO} = 0.20 (●) and 0.30 (○) after the application of different strain for 60 seconds. The gels were subjected to a constant frequency of 10 rad/s and strain of 0.5 % for 200 seconds, followed by higher strain for 60 seconds. Restoration of gel was monitored in the subsequent time sweep (at a frequency of 10 rad/s and strain of 0.5%) for 200 seconds. The shear-recovery cycles were performed five times for the same sample to check the reproducibility.
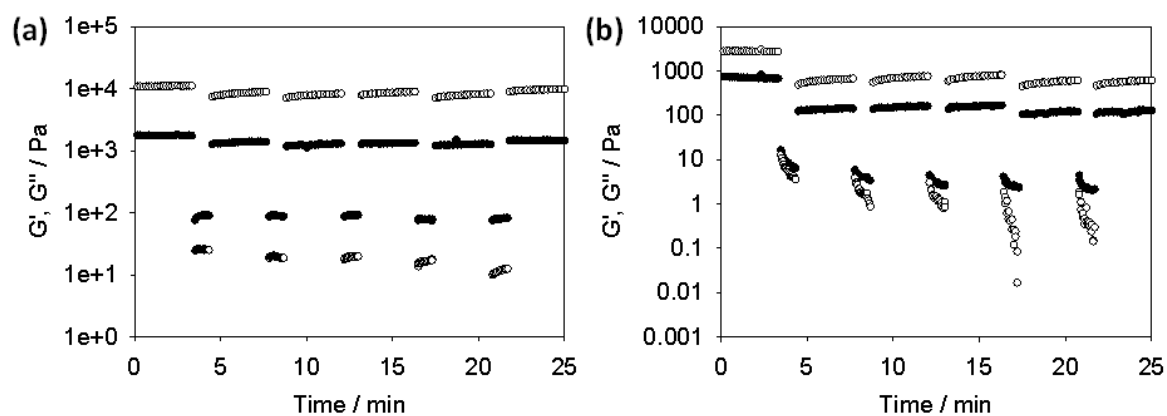
Figure S5. Recovery of the storage (○) and loss (●) moduli of gels prepared using FmocLG (5 mg/mL) at a DMSO volume fraction of (a) 0.10 and (b) 0.40. The gels were subjected to a constant frequency of 10 rad/s and strain of 0.5 % for 200 seconds, followed by higher strain of 300 % for 60 seconds to totally destroy the gel to a liquid state. Restoration of gel was monitored in the subsequent time sweep (at a frequency of 10 rad/s and strain of 0.5%) for 200 seconds. The shear-recovery cycles were performed five times for the same sample to check the reproducibility.
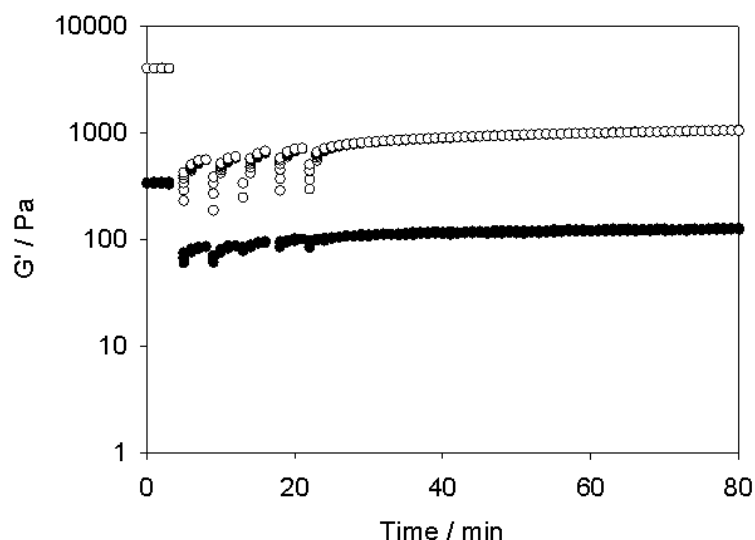
Figure S6. Recovery of the storage (○) and loss (●) moduli of gels prepared using FmocLG (final concentration of 5 mg/mL) at a DMSO volume fraction of 0.40. The gels were subjected to a constant frequency of 10 rad/s and strain of 0.5 % for 200 seconds, followed by higher strain of 300 % for 60 seconds to totally destroy the gel to a liquid state. Restoration of gel was monitored in the subsequent time sweep (at a frequency of 10 rad/s and strain of 0.5%) for 200 seconds. The shear-recovery cycles were performed five times for the same sample to check the reproducibility. Finally, a longer recovery period was used.
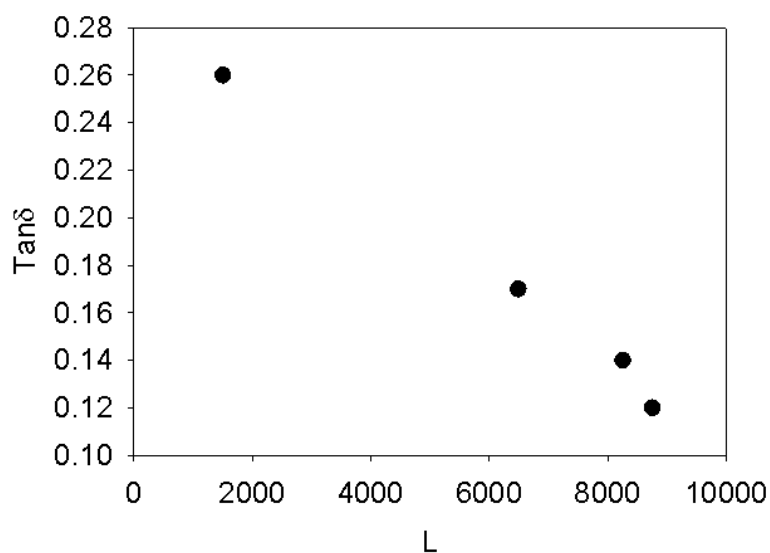

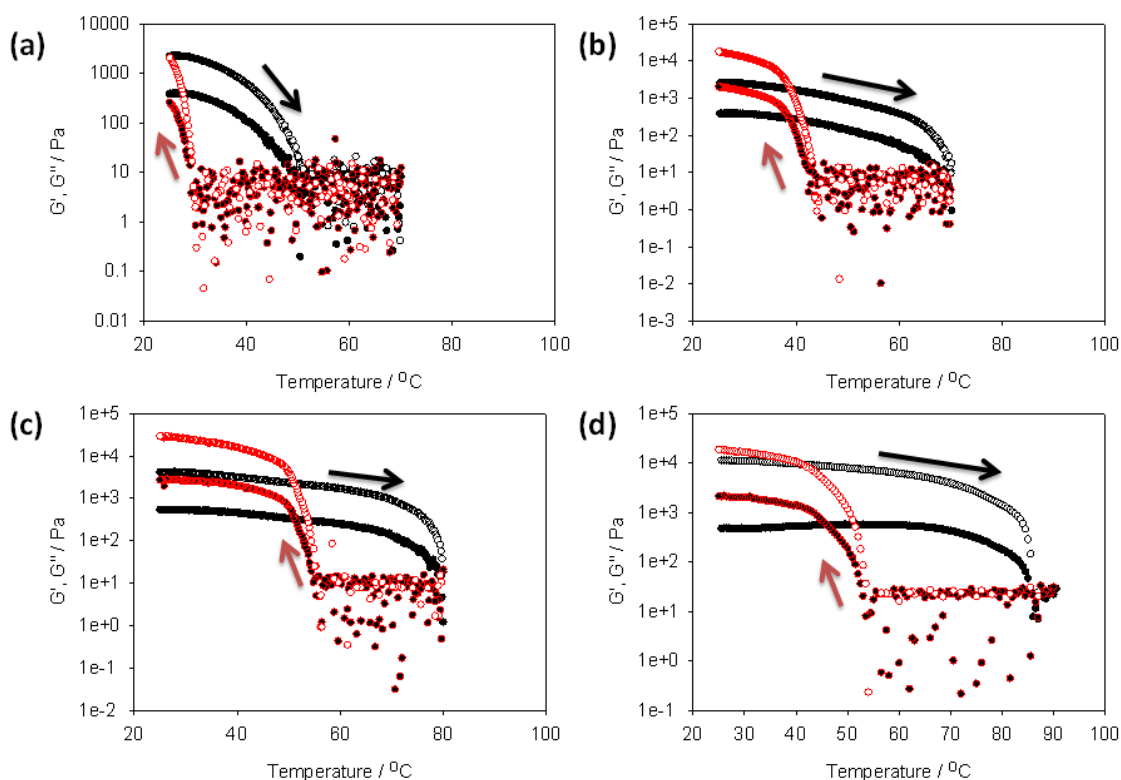**Figure S7.** Correlation between tan δ and L (as determined by SANS).

Figure S8. Effect of heating and cooling on gels formed using FmocLeuGly (final concentration 5 mg/mL) at different volume fractions of DMSO. (a) DMSO volume fraction = 0.40; (b) 0.30; (c) 0.20 and (d) 0.10. The heating and cooling rate was 2 ^{o}C / min in each case. Red data shows the cool cycle. For heating and cooling, open symbols represent G′ and closed symbols represent G″. Black arrows show heating, red arrows show the cooling. For all of the above, open symbols represent G′. Closed symbols represent G″.
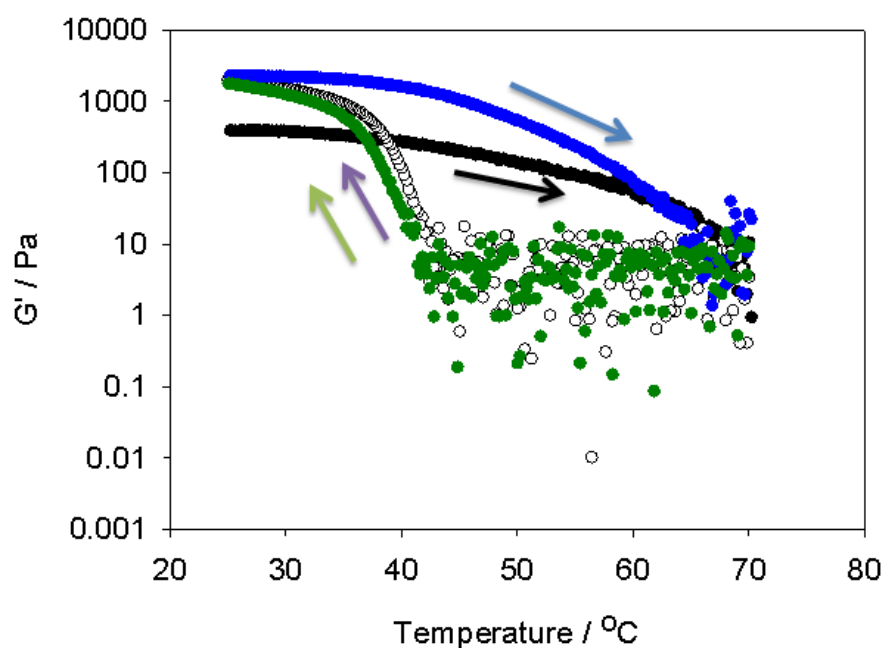
Figure S9. Effect of repeated heat-cool cycles for a gel prepared using FmocLeuGly (final concentration of 5 mg/mL) at a DMSO volume fraction of 0.30. For clarity, only data for G′ is shown. First heat = black data. First cool = white data. Second heat = blue data. Second cool = green data. Black arrow shows first heating, purple arrow shows first cool, blue arrow shows second heating and green arrow shows second cool.