Supplementary material

Microgels as viscosity modifiers influence lubrication performance of continuum

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Figure S1. Particle size distribution of whey protein microgels (WPM) with 10.0 wt% (a) and 15.0 wt% (b) of whey protein content, respectively, in phosphate buffer (square) and 75.0 wt% corn syrup solutions (triangle). Mean hydrodynamic diameter is approximately 90 nm (polydispersity index ~ 0.15) and it does not depend on either the protein concentration forming the particles or the dispersant viscosity.
Figure S2. Linear elastic (closed symbols) and viscous moduli (open symbols) of 10.0 wt% (squares) and 15.0 wt% (triangles) whey protein gels. Elasticity shows an increase of two-orders of magnitude on increasing the whey protein concentration by 5.0 wt%.
Figure S3. Shear viscosity of microgel dispersions with Newtonian continuum. Namely, Buffer10 (close squares), Buffer15 (open squares), 50CS10 (close circles), 50CS15 (open circles), 75CS10 (close triangles) and 75CS15 (open triangles). The particle volume fraction of microgels is fixed at 50 vol% in all systems. The continuous lines represent fittings using equation 1. Error bars represent standard deviations.
Figure S4. Shear stress as function of shear rate for microgel dispersions in Newtonian continuum. Namely, Buffer10 (close squares), Buffer15 (open squares), 50CS10 (close circles), 50CS15 (open circles), 75CS10 (close triangles) and 75CS15 (open triangles). The particle volume fraction of microgels is fixed at 50 vol% in all systems.
Figure S5. Shear stress as function of shear rate for microgel dispersions in xanthan gum solutions. Namely 0p5XG10 (close squares), 0p5XG15 (open squares), 1XG10 (close triangles) and 1XG15 (open triangles). The particle volume fraction of microgels is fixed at 50.0 vol% in all systems. The continuous lines represent fittings using equation 1. Error bars represent standard deviations.