

SUPPORTING INFORMATION

Field-driven reversible alignment and gelation of magneto-responsive soft anisotropic microbeads

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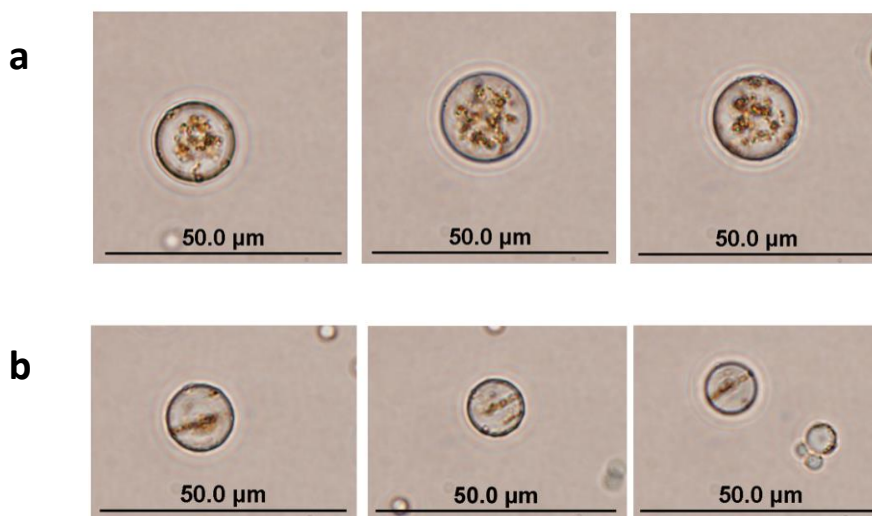


Figure S1. Optical microscopy images of PDMS beads containing 2.5 wt% of magnetic nanoparticles in (a) randomly dispersed state and (b) polymerized after the MNPs have been aligned in the presence of magnetic field. Note that the MNPs in some beads can be aligned in the form of single chain traversing the host bead.

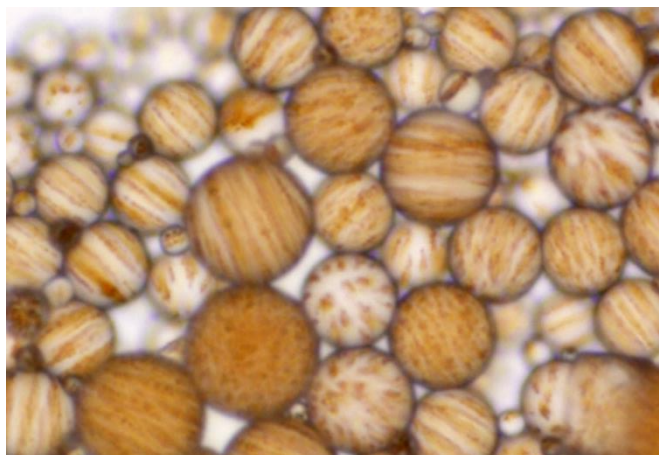


Figure S2. Optical microscopy image of a suspension of PDMS beads containing 10 wt% of aligned magnetic nanoparticles. The higher density chains in the beads are clearly distinguishable.

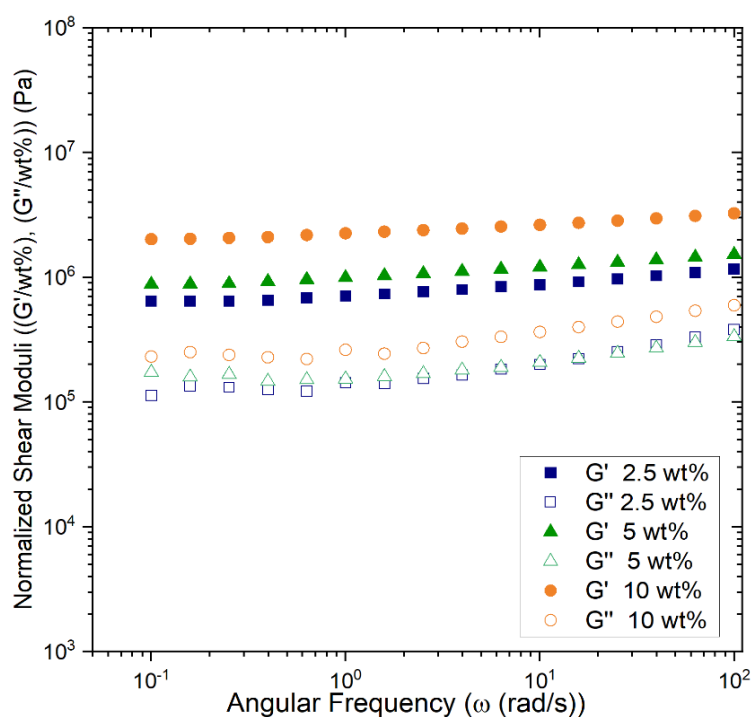


Figure S3. Normalized storage, G' , and loss, G'' , moduli for magnetic microbeads with 2.5 wt%, 5 wt%, and 10 wt% aligned MNPs embedded in the SMB PDMS matrix. The normalization of the rheology data (by dividing the moduli by the wt% of MNPs) results in good (but not complete) clustering of the curves, highlighting a general correlation between the weight % of MNPs in the microbeads and the viscoelasticity of the dispersion.

Additional Supporting information Provided Separately

The dynamics and interactions in the SMB systems are illustrated in the following movies:

Movie S1. SMBs with magnetically aligned MNPs being disrupted and gradually re-assembling into long-range percolated network in the absence of external field. Movie is speeded up 2X.

Movie S2. SMBs with magnetically aligned MNPs form percolated networks having the ability to re-form after they are magnetized (19 mT) and disturbed. Scale bar is 200 μm .

Movie S3. Once demagnetized, the SMBs with magnetically aligned MNPs demonstrate little to no interactions due to the removal of the permanent magnetization. Scale bar is 200 μm .