Electronic Supplementary Material (ESI) for Soft Matter.

Triggered Disassembly and Reassembly of Actin Networks Induces Rigidity Phase Transitions

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Supporting Information (SI)

FIGURE S1. STORAGE MODULUS FOR STEADY-STATE ACTIN NETWORKS COMPARED TO THOSE MEASURED AT THE BEGINNING AND END OF DISASSEMBLY AND REASSEMBLY

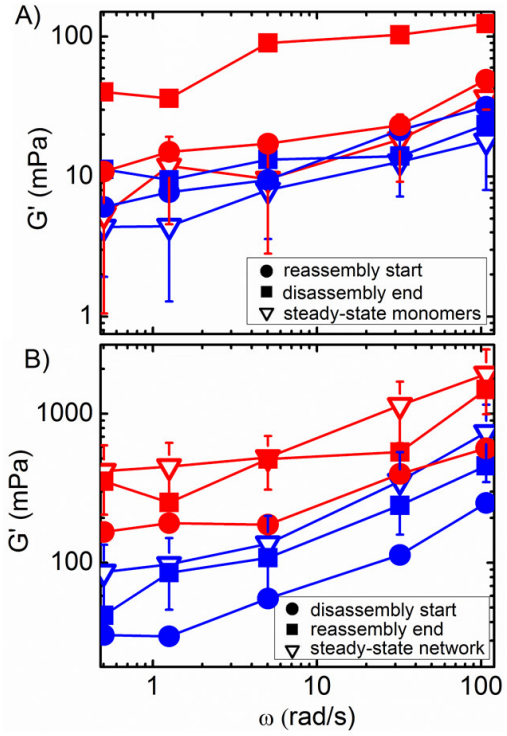

FIG. 1. Storage moduli as a function of frequency for entangled (blue) and crosslinked (red) networks measured at the beginning (filled circles) and end (filled squares) of dynamic measurements compared to those measured for steady-state systems (open triangles). Steady-state systems refer to monomer solutions for disassembly (A) and fully-percolated networks for reassembly (B). As shown, the moduli measured at the beginning and end of each process are in good agreement with those measured in steady-state. Steady-state moduli values are also comparable to previously reported values [26, 31, 33, 60, 61]. We note that, at the end of triggered disassembly, $G^{'}$ for the crosslinked network indicates that it has not fully disassembled; however, the remaining disassembly completes during the ∼8–10 min time frame required to begin subsequent reassembly, as indicated by the initial moduli measured for reassembly.

FIGURE S2. TIME COURSE OF STORAGE MODULUS FOR ACTIN NETWORKS DURING DISASSEMBLY AND REASSEMBLY

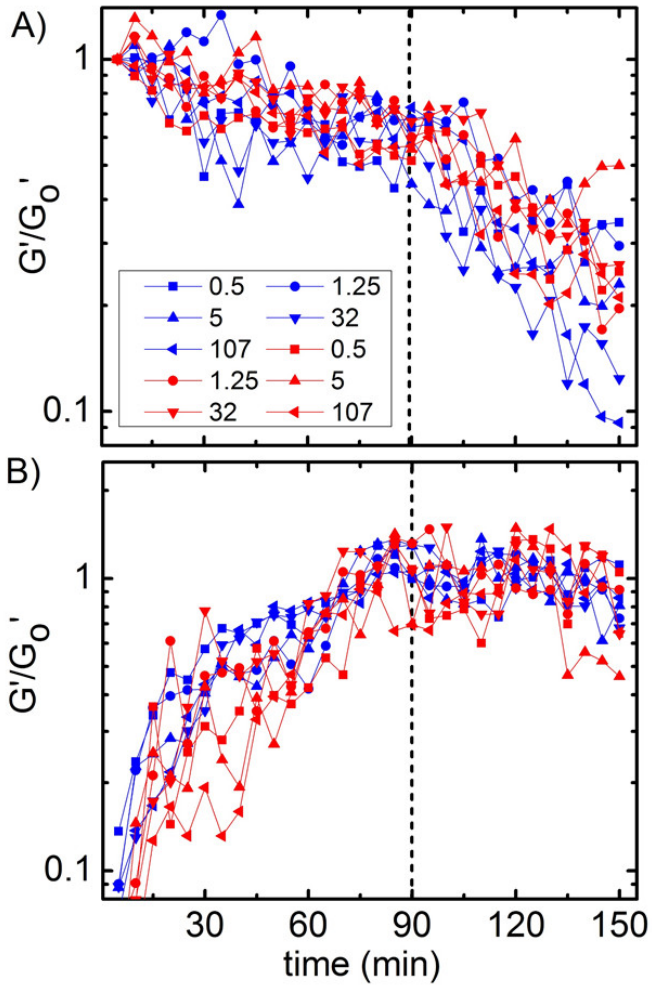

FIG. 2. Time course of storage modulus, G', normalized by the fully-assembled network value G'_o, for entangled (blue) and crosslinked (red) actin networks during (A) disassembly and (B) reassembly. All data points are measurements taken at 5 different frequencies in the range ω = 0.5 - 107 rad/s as shown in the legend. Dashed vertical lines correspond to the observed crossover time (90 min) between the first and second phases.

FIGURE S3. TIME COURSE OF AVERAGED VISCOUS MODULUS FOR ACTIN NETWORKS DURING DISASSEMBLY AND REASSEMBLY

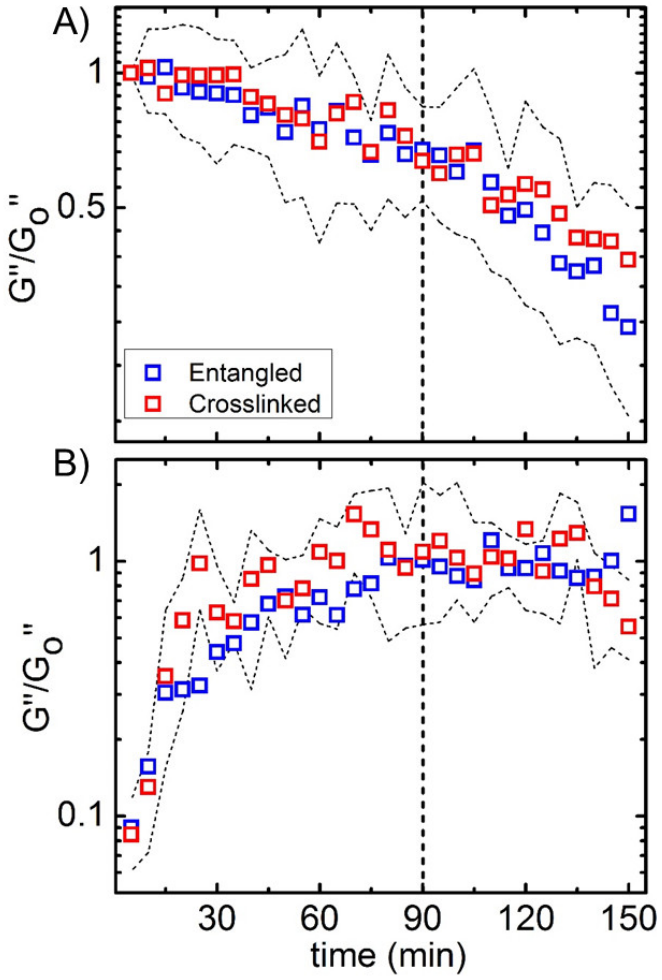

FIG. 3. Time course of averaged viscous modulus, G'', normalized by the fully-assembled network value G''_o, for entangled (blue) and crosslinked (red) actin networks during (A) disassembly and (B) reassembly. The two dashed lines correspond to the maximum (top) and minimum (bottom) measured values among measurements taken at 5 different frequencies in the range $\omega = 0.5 - 107$ rad/s. Dashed vertical lines correspond to the observed crossover time (90 min) between the first and second phases.

FIGURE S4. TIME COURSE OF VISCOUS MODULUS FOR ACTIN NETWORKS DURING DISASSEMBLY AND REASSEMBLY

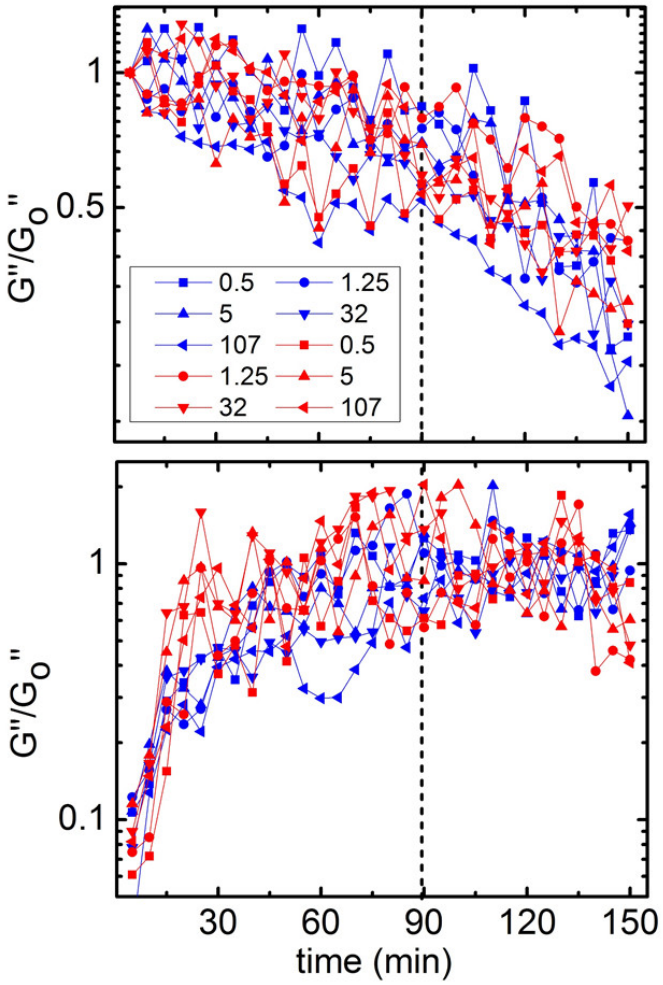

FIG. 4. Time course of viscous modulus, G'', normalized by the fully-assembled network value G''_o, for entangled (blue) and crosslinked (red) actin networks during (A) disassembly and (B) reassembly. All data points are measurements taken at 5 different frequencies in the range ω = 0.5 - 107 rad/s as shown in the legend. Dashed vertical lines correspond to the observed crossover time (90 min) between the first and second phases.