Electronic Supplementary Material (ESI) for Soft Matter.

Supplementary Movie 1

Supplementary Movie 1 compares the flow of a weakly attractive calcite gel [calcite dispersion at a volume fraction of 10% in pure water (left panels)] and of a strongly attractive calcite gel [calcite dispersion at a volume fraction of 7% in a sodium (94 mM) and calcium (3 mM) hydroxide solution (right panels)] sheared at 30 1/s in a smooth Taylor-Couette geometry.

The top panels show time-resolved velocity maps v(r,z). Each map corresponds to an average over 50 successive ultrasonic acquisitions performed over a total duration of 83 ms. The middle panels show time-resolved velocity profiles v(r) averaged over the z-direction. The dash-dotted lines show the velocity profile expected for a Newtonian fluid in the absence of wall slip. The bottom panel displays the normalized stress responses of both samples recorded simultaneously to the velocity data (with the weakly attractive gel in black and the strongly attractive gel in red). The time origin t=0 corresponds to start-up of shear.

Supplementary Movie 2

Supplementary Movie 2 shows the long-time evolution of the flow of a strongly attractive calcite gel [calcite dispersion at a volume fraction of 7% in a sodium (94 mM) and calcium (3 mM) hydroxide aqueous solution] sheared at 35 1/s in a Taylor-Couette geometry with a smooth cup and a rough bob.

The top right panel shows time-resolved velocity maps v(r,z) and the corresponding z-averaged velocity profiles v(r) are displayed in the top left panel. The dash-dotted line shows the velocity profile expected for a Newtonian fluid in the absence of wall slip. The bottom panel shows the stress response recorded simultaneously to the velocity data over 2800 s. The time origin t=0 corresponds to start-up of shear.