

Supplementary Information

Rheology of Capillary Foams

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1. Normal Force during Strain Sweep Oscillatory Test

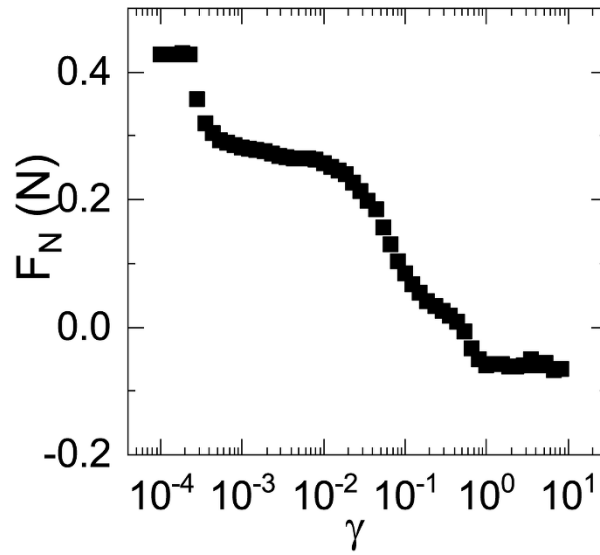


Figure S1: Plot of normal force of the foam during the increasing strain amplitude test.

2. Measuring Capillary Foam Quality

Capillary foams were prepared by frothing a mixture of polyvinyl chloride particles (10 wt. %), Trimethylolpropane trimethacrylate and deionized water in a 20 ml glass vial at 30,000 rpm for 3 min with an IKA Ultra-Turrax T10 homogenizer. The height of the prepared capillary foam was measured, and the foam volume was obtained by using the cylinder volume equation. The foam quality (gas volume fraction) was obtained from **Eq. S1**

$$\text{Gas Volume} = \text{Foam Volume} - \text{Initial suspension volume} \quad (\text{S1a})$$

$$\text{Foam Quality } (\phi) = \frac{\text{Gas Volume}}{\text{Foam Volume}} \quad (\text{S1b})$$

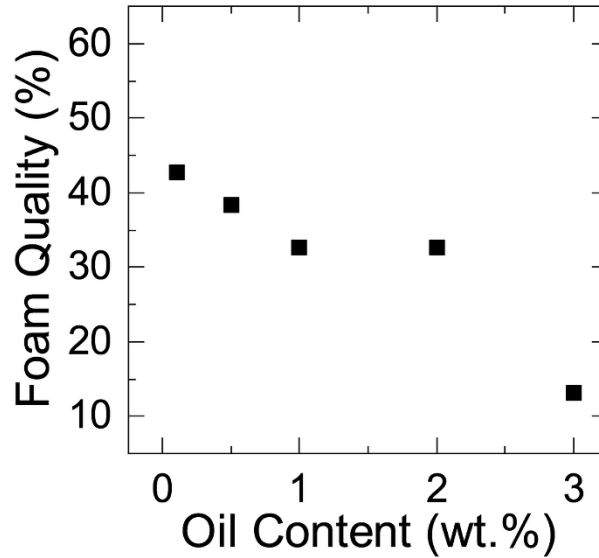


Figure S2: Volume fraction of air present in capillary foam at varying oil concentrations.

3. Controlled Stress Experiments in Couette Geometry

Controlled stress experiments were performed in a couette geometry without sand paper affixed to the walls of bob or the cup. **Fig. S3** shows the flow curve obtained from the controlled stress experiment in the couette geometry. The plot shows an initial increase in the stress with strain rate, followed by a stress plateau over a range of strain rates; this data trend is similar to the trend observed when the same experiment was carried out in the parallel plate geometry. However, we are unable to gather further data at higher stresses and strain rates because slip of the capillary foam at the walls of the instrument, prevents proper shearing of the foam during the experiment.

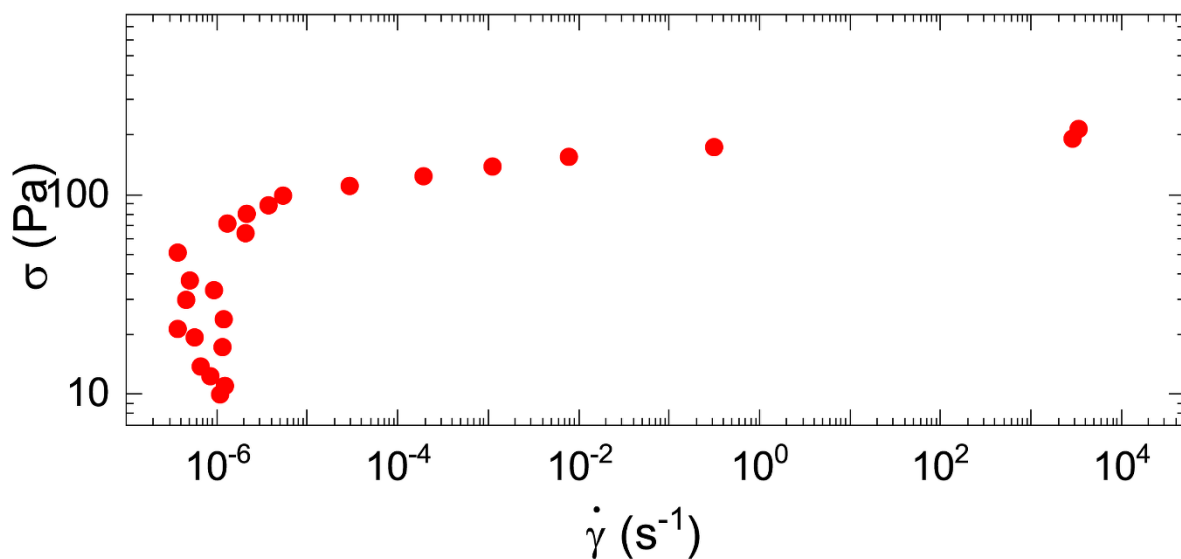


Figure S3: Plot of stress versus strain rate of capillary foams in couette geometry.

4. Yield Stress of PVC Capillary Suspensions

Capillary suspensions were prepared by mixing PVC particles (10 wt. %), TMPTMA (2 wt. %) and DI water (88 wt. %) with a homogenizer. The stress-strain rate plot for the capillary suspension was obtained from a controlled stress experiment on a parallel plate rheometer. The red line in the plot denotes the inferred yield stress of the capillary suspension.

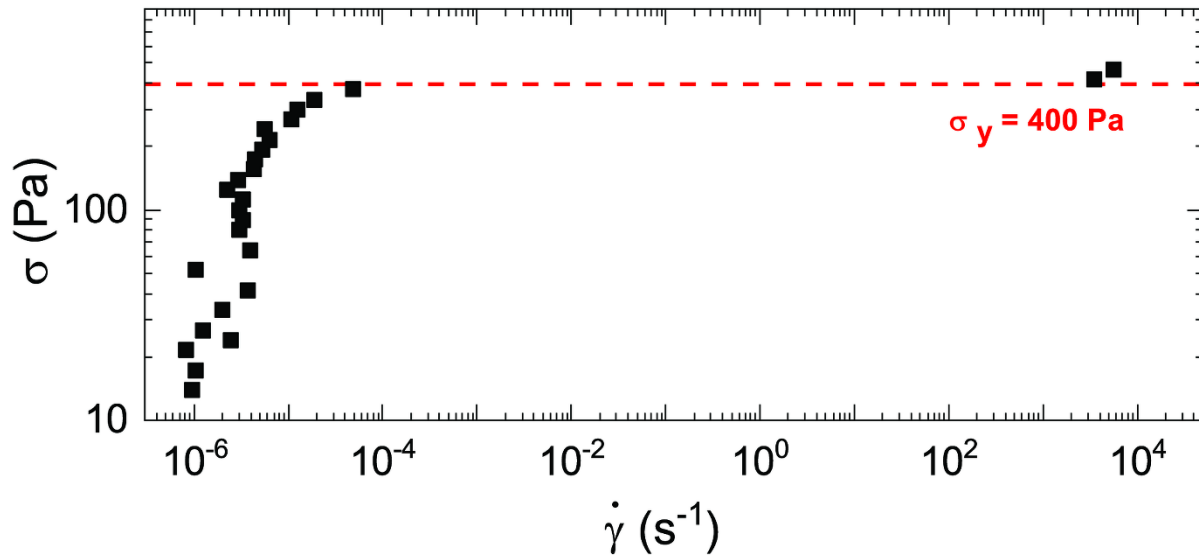


Figure S4: Plot of stress versus strain rate for PVC capillary suspensions.