

Abstract Submitted  
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**Rheological measurements of gels via ultrasonic levitation of gel drops**<sup>1</sup> J. R. SAYLOR, XINGCHEN SHAO, Clemson University, STEVEN FREDERICKS, University of Minnesota, JOSHUA BOSTWICK, Clemson University — The application of ultrasonic levitation to the measurement of surface tension of liquid drops has a rich history. However this method has not been extended to gels which, unlike liquids, have a finite elasticity. Herein a method is presented for obtaining measurements of elasticity, surface tension, and viscosity of ultrasonically levitated gel drops. Agarose, a hydrogel, was the material explored. This approach is a significant development given that gels are of growing importance due to their relevance to biomedical applications and exhibit behaviors partially determined by their elasticities. Moreover, obtaining surface tension of gels is important but challenging since measurements cannot be made using standard Wilhelmy plate or DuNuoy ring methods, each of which cannot be applied without breaking the gel. Herein a theoretical development is presented which enables obtaining elasticity, surface tension, and viscosity of a gel drop from characteristics of its response to ultrasonic excitation. Measurements of surface tension and viscosity obtained using this approach are obtained for gel drops having elasticities ranging from 12.2 Pa to 200.3 Pa.

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