

Abstract Submitted  
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**Surface tension of polyelectrolyte coacervates** JIAN QIN, DIMITRIOS PRIFTIS, Institute for Molecular Engineering, U. Chicago, ROBERT FARINA, Chemical Engineering, UCSB, SARAH PERRY, LORRAINE LEON, JONATHAN WHITMER, KYLE HOFFMAN, MATTHEW TIRRELL, JUAN J. DE PABLO, Institute for Molecular Engineering, U. Chicago — Stoichiometric solutions of polycations and polyanions can phase separate, resulting in the coexistence of a supernatant phase and a polymer-rich complex phase. The complex phase may be liquid-like or solid-like, depending on the ionic strength and the temperature. Liquid-like complexes, known as “coacervates”, retain a large amount of water, up to 70-80% by weight, and exhibit an ultra-low interfacial tension with the coexisting supernatant phase (smaller than the water surface tension by three orders of magnitude). Previous experiments have observed that this interfacial tension decreases with the amount of salt, and vanishes near a critical salt concentration according to a  $3/2$  power of the salt undersaturation. In this work we derive analytical expressions for the interfacial tension in both the low and high charge density limits. For solutions with added salts, we provide explicit expressions for the interfacial tension near the critical salt concentration and explain the  $3/2$  power dependence. Our results are shown to be in good agreement with experiment.

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