

Abstract Submitted
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Bursting the Taylor cone bubble ZHAO PAN, TADD TRUSCOTT, Brigham Young University — A soap bubble fixed on a surface and placed in an electric field will take on the shape of a cone rather than constant curvature (dome) when the electrical field is not present. The phenomenon was introduced by J. Zeleny (1917) and studied extensively by C.T. Wilson & G.I. Taylor(1925). We revisit the Taylor cone problem by studying the deformation and bursting of soap bubbles in a point charge electric field. A single bubble takes on the shape of a cone in the electric field and a high-speed camera equipped with a micro-lens is used to observe the unsteady dynamics at the tip. Rupture occurs as a very small piece of the tip is torn away from the bubble toward the point charge. Based on experiments, a theoretical model is developed that predicts when rupture should occur. This study may help in the design of foam-removal techniques in engineering and provide a better understanding of an electrified air-liquid interface.

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