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Capillary and elastic failure of particle-stabilized droplets NIVI SAMUDRALA, RAPHAEL SARFATI, Yale University, JIN NAM, Amore Pacific & Co, ERIC DUFRESNE, Yale University — Colloidal surfactants robustly stabilize fluid interfaces against spontaneous phase separation. Like molecular surfactants, they improve the thermodynamic and kinetic stability of the interface. Here, we investigate the mechanical stability of particle-stabilized droplets using micro-pipette aspiration. We observe two distinct modes of failure. In capillary failure, fluid is pulled through the gaps between the particles. In elastic failure, the particle-laden interface buckles like an elastic shell. We explore the impact of the fluid surface tension and particle interactions on these two modes of failure.

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