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**The role of surfactants in drop formation and thread breakup** PRITISH KAMAT, BRAYDEN WAGONER, SUMEET THETE, OSMAN BASARAN, Purdue University — The ability of surfactants to adsorb onto and lower the surface tension of water-air and water-oil interfaces is exploited in industrial applications, nature, and everyday life. An important example is provided by drop formation where a thinning liquid thread connects an about-to-form globular, primary drop to the rest of the liquid that remains on the nozzle when the primary drop falls from it. Surfactants can affect pinch-off in two ways: first, by lowering surface tension they lower capillary pressure (which equals, to highest order, surface tension divided by thread radius), and second, as surfactant concentration along the interface can be non-uniform, they cause the interface to be subjected to a gradient of surface tension, or Marangoni stress. By means of high-accuracy simulations and supporting experiments, we clarify the role played by surfactants on drop formation and thread breakup.

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