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**Dynamics of colloidal consolidation process inside an emulsion droplet** DANHONG WANG, Washington University in St. Louis, PATRICK SPICER, Procter and Gamble, AMY SHEN, Washington University in St. Louis, WASHINGTON UNIVESITY/P & G COLLABORATION — Dense packing of small clusters of microspheres proposed by Manoharan, et al. involves removal of fluid from the droplets (dispersed phase) into the continuous phase, which is referred to as the consolidation process. The consolidation process can be characterized as a diffusion process with moving boundaries. Therefore its dynamics is largely controlled by the diffusivity between the dispersed and continuous phases. In addition to the diffusivity, surfactant concentration and the number of particles inside the droplets might also change the dynamics of the consolidation process. In this work, we study the effects of surfactant concentration and particle number on the consolidation process. We found that if normalized by the initial droplet size and the consolidation time, the consolidation process obeys the same power law with the power coefficient of 1/2, regardless of the significant change in droplet diameter, as well as surfactant concentration and particle numbers. We also examine the consolidation behavior of anisotropic particles and compare with that of spheres.

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