

Abstract Submitted
for the DFD13 Meeting of
The American Physical Society

Controlled Coating of Self-Assembled Sphere Clusters by Gravitational Forcing STEVEN G. JONES, ABHINAV AHUJA, VIVIAN TRUONG, SCOTT S.H. TSAI, Department of Mechanical and Industrial Engineering, Ryerson University — The motion of a spherical particle moving through a liquid-liquid interface due to gravitational force is one of the classical problems of fluid dynamics. In some situations, a single particle has insufficient gravitational energy to break through the interface, but a cluster of multiple particles overcomes the interfacial tension energy barrier to pass through. Here we show with experiments that particles self-assemble into clusters upon settling at an oil-water interface. When a cluster is sufficiently large, the cluster will pass through the interface and becomes conformally coated. We find that the number of particles inside one cluster is proportional to a power-law of the Bond number, which describes the ratio between gravitational and surface tension energies. We demonstrate that the size of the coated particle cluster can be tuned by altering the radius of the particles and changing the interfacial tension.

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None

Date submitted: 31 Jul 2013

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