

Janus Particles at Fluid-Fluid Interfaces

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Janus particles are asymmetric particles that have two regions of opposite wettability. Because of their amphiphilicity, it is widely hypothesized that Janus particles would make an ideal solid surfactant for the stabilization of multiphasic fluid mixtures. We have studied the behaviors of Janus particles at fluid interfaces based on experimental and numerical approaches. We have shown that 1) Janus spheres at an air-water interface interact with each other via attractive interactions and 2) the configuration of non-spherical Janus particles is significantly affected by the geometry and wettability of these particles. Our results provide critical insights into designing Janus particles that can function as effective solid surfactants that could be useful in efficient oil recovery and emulsion stabilization.

