

Abstract Submitted
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Modeling of tunable structural re-configuration of Janus colloidal particles¹ DANIEL BELTRAN, RONALD LARSON, Chemical Engineering, University of Michigan, Ann Arbor — Colloidal particles can assemble into a myriad of structures by virtue of the many interaction forces available to them. Variable range attraction and repulsion and the recently explored non-isotropic character, exemplified by Janus particles, are examples of the versatility of colloidal particles as building blocks. A systematic approach to understand the assembly of Janus colloids, as a function of Janus balance and particle concentration is not yet available. In this work we study the phase behavior of Janus particles as a function of the strength of interaction, Janus balance and volume fraction of spherical particles. A secondary goal of this work is the assessment of re-configurability of the structures found. Our results show the range of stability of several structures, including a fluid phase of small clusters, bilayers and worm-like aggregates. We find the bilayer structures are very stable over a range of phase space and provide a good pre-cursor to hexagonally close-packed structures. These findings enable the understanding of the assembly process of Janus building blocks and provide a framework with which to study the kinetics of structure change.

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