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Demonstration of shape selectivity in depletion-induced colloidal aggregation STEPHANE BADAIRE, JOSEPH W. WOODY, CECILE COTTIN-BIZONNE, ABRAHAM D. STROOCK, Dept of Chemical and Biomolecular Engineering - Cornell University — We have developed a set of monodisperse, non-spherical colloids using photolithography in order to elucidate fundamental questions related to the role of shape in defining colloidal phase behaviour and, eventually, to build new microstructured materials. Our goal is to use depletion and DLVO forces to induce specific and directional interactions during the aggregation process of these non-spherical colloids. We will first describe the development and basic characterization of these particles, including index of refraction, zeta potential, polydispersity, and surface roughness. We will then present an initial state diagram of depletion-induced structure, and provide mechanistic insight into the role of specific characteristics of the particles in defining this behaviour. We will finally discuss theoretical calculations of the expected interactions and the possibility of generalizing the results to other colloidal systems.

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