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Capillary bond between rod-like microparticles at interfaces LORENZO BOTTO, KATHLEEN J. STEBE, University of Pennsylvania, Chemical and Biomolecular Eng. Dept. — Elongated microparticles at a fluid interface create interface distortions; when deformations of neighboring particles overlap, the particles attract to minimize the interfacial energy. Two elongated microparticles have been studied -ellipsoids, which are predicted to assemble side-to-side, and cylinders, which chain end-to-end. The differences can be attributed to near field interactions, which we term the capillary bond. We simulate the capillary bond between two elongated particles as a function of inter-particle separation, relative orientation, and particle shape. The particle is represented as a super-ellipsoid, a parameterization which allows the study of a broad class of shapes, from ellipsoids to cylinders with rounded or sharp corners, upon varying a single parameter. The geometric details of the particles have a dramatic effect on the dependence of the capillary bond on the configuration, a finding with strong consequences for micro-structures formed by these particles.

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