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Arrested of coalescence of emulsion droplets of arbitrary size BADEL L. MBANGA, CHRISTOPHER BURKE, Department of Physics and Astronomy, Tufts University, DONALD W. BLAIR, Department of Physics, University of Massachusetts Amherst, TIMOTHY J. ATHERTON, Department of Physics and Astronomy, Tufts University — With applications ranging from food products to cosmetics via targeted drug delivery systems, structured anisotropic colloids provide an efficient way to control the structure, properties and functions of emulsions. When two fluid emulsion droplets are brought in contact, a reduction of the interfacial tension drives their coalescence into a larger droplet of the same total volume and reduced exposed area. This coalescence can be partially or totally hindered by the presence of nano or micron-size particles that coat the interface as in Pickering emulsions. We investigate numerically the dependance of the mechanical stability of these arrested shapes on the particles size, their shape anisotropy, their polydispersity, their interaction with the solvent, and the particle-particle interactions. We discuss structural shape changes that can be induced by tuning the particles interactions after arrest occurs, and provide design parameters for the relevant experiments.

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