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Attraction of Two Floating Spheres at a Viscous Oil-Water Interface ARCHIT DANI, Benjamin Levich Institute, Department of Chemical Engineering, City College of the City University of New York, New York, NY 10031, USA, GEOFF KEISER, MOHSEN YEGANEH, ExxonMobil Research and Engineering Company, Annandale, N.J. 08801, USA, CHARLES MALDARELLI, Benjamin Levich Institute, Department of Chemical Engineering, City College of the City University of New York, New York, NY 10031, USA — The aggregation rate of floating particles at a fluid/fluid interface by capillary forces has drawn significant interest. This 2D phenomenon plays a critical role in self-assembly arrangement relevant to pollination processes in biological contexts, the formation of dense particle laden interfaces for stabilizing emulsions in colloid science and in the bottom up assembly of materials in nanotechnologies. We present the first experiments on the merging of two Teflon particles at an interface between a mineral oil and an aqueous phase for a series of particle pairs, interfacial tension and oil viscosity. The separation distance as a function of time and pair aggregation time are both measured by optically following the movement of the particles. The experimental results are in excellent agreement with our theoretical formulation in which a drag correction accounts for the variation in particle depth of immersion.

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