

Tuning the elasticity of high internal phase Pickering emulsions by colloidal jamming on liquid-liquid interface

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High internal phase emulsions, which their volume fraction of dispersed phase is over 74%, shows solid like property because of their tremendous interfacial area. Many researches claimed models to explain the rheological properties of HIPEs, however, most of them are limited to the surfactant emulsions, and concentrated to the effect of dispersed phase volume fraction. Accordingly, there are very few researches linking rheology of 2D particle layer on the interface of Pickering emulsions. In this study, various concentrations of TiO₂ suspensions were used to tune the elasticity of interface, and fabricated to HIPEs. Above specific TiO₂ concentration, G' values normalized with droplet sizes were much higher than that of empirical model of Princen. To figure out this phenomena, we measured compressibility, and interfacial shear rheology of particle layer on interface. From this study, we established the relationship between elasticity of Pickering HIPEs and elasticity of interface.