POLYMERICALLY STABILIZED LATICES
EFFECT OF THE STABILIZER LAYER

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Abstract

The stabilizer layer of polymerically stabilized latices (and related systems) is systematically varied in thickness and structure. The rheological and structural consequences of these changes are considered for both stable and weakly flocculated colloids. In the stable systems the effect of chain lenght of the stabilizer molecules is studied. The plateau moduli are used to determine the interaction potential. Up to considerable layer thicknesses effective hard sphere diameters and volume fractions can be determined. They can be used in scaling the rheological characteristics. Scaling for the stabilizer layer thickness is considered in detail. In a second stable system the stabilizer layer has been altered by slightly reducing the solubility of the solvent for the stabilizer molecules. In this manner thinner but harder layers are generated. The results can be explained in part by changes in effective volume fraction. Shear thickening however is affected differently, in line with recent numerical simulations.

Once the solubility of the suspending medium for the stabilizer molecules drops below a critical value, flocculation sets in. For weak flocculation the high shear behaviour is in line with that of similar stable systems. The low shear behaviour changes however dramatically. Rheological measurements on dilute suspensions and pohase diagrams are used to deduce stability parameters. They do not fully coincide. The resulting rheological behaviour can be related qualitatively to the stability parameters. Other scaling procedures are explored.