

A Study of pH-triggered Heteroaggregation within Dispersions Containing Latex and Pigment Particles

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Homoaggregation is a well known process for colloid and surface chemistry. However, a more complicated version of aggregation is called heteroaggregation [1]. This term is used to describe aggregation within colloidal systems consisting of more than one type of particle. In this study we examine heteroaggregation within a mixed dispersion consisting of latex and pigment particles. The particles are stabilised by a pH-responsive surfactant and the heteroaggregation which occurs is pH-triggered. The aggregation leads to gel formation. Our objective is to obtain a fundamental understanding of the heteroaggregation process and its role in gel formation. In this work the critical coagulation values of pH for both the latex and pigment dispersions were determined using visual observation technique (direct) and a UV-VIS spectroscopy method (indirect). The latter involved the wavelength-exponent method (i.e., n-value). The n-value is very sensitive to aggregation [2]. Electrophoretic mobilities were also measured as a function of pH and DLVO theory [3] was applied in order to obtain a better understanding of the aggregation processes. Our preliminary analysis shows the system starts becomes unstable and aggregates when the total two-particle interaction energies become smaller than critical values. Gelation phase diagrams for the mixed dispersions are also shown and a possible mechanism for heteroaggregation is presented. [4]

References

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