

Effect of Initial Dispersion of Coating Solution on the Structure and Property of Bulk Polymer Nanocomposites

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While typical coating solution in industry consists of colloid-polymer mixtures, the microstructure of particles and polymers in the coating solutions are strongly dependent upon their interactions, which can systemically vary with the component concentrations. When the colloidal system is concentrated by solvent evaporation with drying, the continuous change of component concentrations also causes a continuous change in the interparticle interaction.

In this study, we show how the initial dispersion of the colloidal coating solution can influence the final structure and property of the polymer nanocomposites. To vary the initial dispersion state, we set to vary the initial dispersion concentrations. Ensemble-averaged microstructures were analyzed with small angle x-ray scattering measurement and rheological properties were analyzed with rheometer.