

Characterization of the interactions between polymethacrylate-based aqueous polymeric dispersions and aluminum lakes

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Abstract:

Instability in film coating formulations can arise from interactions between aluminum lake pigments and aqueous polymeric dispersions. The purpose of this study was to characterize the interactions between three polymethacrylate-based aqueous polymeric dispersions (Eudragit1 RS 30 D, Eudragit1 L 30 D-55, and Eudragit1 NE 30 D) and aluminum lakes. Particle size measurements, pH stability profiles, zeta potential measurements, and microscopy were used to study mixed dispersions of the polymeric latices and the lakes. Interactions leading to dispersion instability were related to the surface charge of the components in the formulation. Interactions between the ionic polymers and the lakes arose from instability of the lakes outside a certain pH range resulting in the release of electrolytes, which led to aggregation of the polymeric particles. Interactions between the nonionic polymer and the lakes were related to the polymer modifying the surface charge of the lakes, resulting in aggregation of the pigment particles.