

Intercalative Nanocomposites of Layer Silicates and Water-borne Organic Resins for Colorant Dye Fixation

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Intercalative layered nanocomposite of expandable layer silicate (synthetic hectorite: Laponite) and water-borne organic resins such as polyurethane, melamine and polyester are prepared. In particular, an in-situ dispersion of layer silicate and polyester granule in an aqueous solution could be applied successfully for the preparation of layer nanocomposite with capability of dye molecule fixation. A colorant receiving coating layer consisted of resin-silicate hybrid material is obtained by applying the hybrid coating solution on target substrate, followed by thermal curing. Intercalation behavior of dye molecules into the color receiving layer was monitored by XRD and colorimeter depending upon the kinds of dye molecules and physical parameters such as sorption period and temperature. The intercalative coloring process offers a new way of surface coloring with cost-effective and environmentally-friendly alternative.