

NANOSTRUCTURED ORGANIC-INORGANIC HYBRID MATERIALS FROM AQUEOUS POLYMER DISPERSIONS

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Organic-inorganic hybrids with well defined morphology and structure controlled at the nanometric scale represent a very interesting class of materials. They find use in a broad range of advanced technology as well as in more conventional application fields. Emulsion polymer suppliers, as well as many other material and product suppliers, have been practicing nanotechnology for decades. Common small-sized emulsion polymers can be described in terms of nanotechnology. In contrast to emulsion polymer nanostructures, or to conventional composites, polymer/clay nanocomposites ranks among the emerging new nanocomposites.

We have investigated the properties of the polymer/organically modified montmorillonite (MMT) latexes prepared via in-situ emulsion free radical copolymerization. Organoclays (Cloisite, Nanocor) were obtained by cationic exchange of MMT with quarternary salts of acrylic or methacrylic acids having alkyls of various lengths.

The intercalated anchoring monomers were used for copolymerization with styrene and butylmethacrylate.

The structure and physical properties of the prepared aqueous polymer dispersions were studied by WAXS, SAXS, DSC and mechanical and dielectric spectroscopy. X-ray diffraction studies showed that all systems were swollen after monomer intercalation and the increase of interlayer d-spacing for monomer and polymer was dependent on the monomer composition.

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