

Impact of non-ionic surfactant chemical structure on morphology and stability of polystyrene nanocomposite latex

Greesh N
Ray SS

ABSTRACT:

Polystyrene (PS) colloid particles in presence of non-ionic surfactant-modified clay particles were prepared by the free-radical polymerization of styrene monomers in emulsion. Three different types of non-ionic surfactants, sorbitan monopalmitate (Span[®]40), polyethylene glycol octadecyl ether (Brij[®]S10), and polyoxyethylene (9) nonylphenylether (Igepal[®]Co-630) were used for the preparation of surfactant-modified clay. High-resolution transmission electron microscopy studies showed that few colloid PS particles with clay mineral layers at the surface were obtained; the particle sizes were observed to be in the micrometer size range, and stable dispersions were obtained when Span[®]40 and Igepal[®]Co-630 modified clay minerals were used as stabilizers. The clay mineral particles were observed to be mostly encapsulated by PS latex particles, and a typical morphology was observed when Brij[®]S10-modified clay was used as a stabilizer. This strategy can be applied to develop stable polymer latex particles via emulsion polymerization.