

Hybridization of smectite crystallites with microspherical silica particles

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Crystal growth of a layered smectite (a layered silicate) on monodispersed spherical silica particles has been investigated. Hydrothermal reactions between spherical silica and precursors of smectites (Mg, Li or Al salt) in the presence of urea resulted in formation of core-shell (silica-smectite) particles. Because of the heterogeneous nucleation, the fine crystallites were firmly glued on the silica substrate without flaking off the silicate layers from the silica in aqueous media. Cation-exchange reactions of the smectites on the hybrids with a long chain alkylammonium ion have been conducted to modify the surfaces for possible applications as supports of an active ingredient for controlled release.