

Nanocomposite polymer materials

Catheline A. L. Colard, Richard A. Cave, Nadia Grossiord and Stefan A. F. Bon*

Department of Chemistry, University of Warwick, Coventry CV4 7AL, UK. www.stefanbon.eu

Abstract

We synthesize a variety of polymeric molecules and particles and investigate their use as building blocks for the design of more complex colloidal structures. We reported the use of nano-sized solid particles, *i.e.* Laponite clay discotic particles, as Pickering stabilizer in the miniemulsion polymerisation of styrene. We further investigated the possibility of using nano-sized Pickering stabilisers in (mini)emulsion polymerisations.

We report an innovative method to fabricate nanocomposite reinforced polymer foams using low glass transition temperature polymer latexes in presence of nanoparticles. Our strategy relies on the combination of using ice crystals as cellular templates and confining the assembly and autohesion/film formation of the latex particles and silica nanoparticles into a composite self-supporting microstructure in the regions between.