

(Structural Analysis of Polymer Nanocomposites)

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Polymer nanocomposite has been emerged as a new material, with enhanced physical properties dispersing nanoparticles into the polymer matrix. This talk will discuss the recent research progress on polymer nanocomposites. Specifically, scattering method is introduced to understand particle/polymer microstructures in polymer nanocomposites.

An example of the study is presented; The states of nanoparticle dispersions in concentrated polymer solutions are studied with extensive small angle scattering and NMR experiments. The local order and long wave length concentration fluctuations of nanoparticles are obtained from the analysis of scattering structure factors and compared with the Polymer Reference Interaction Site Model (PRISM) theory. Exploiting contrast matching small-angle neutron scattering all partial collective structure factors of particles, polymers and their interface are characterized establishing the existence and size of adsorbed polymer layers.