

The Rheological Behaviour of Deformable Particles:

Poly-NIPAM Aqueous Microgels

T.J. Huang and J.W. Goodwin

School of Chemistry, University of Bristol, Cantock's Close, Bristol, England, BS8 1TS

Abstract

Monodisperse crosslinked poly-NIPAM particles were prepared by emulsion polymerisation. The swelling of the particles was characterised and the rheology of the system was investigated. The capillary viscometry results showed that the intrinsic viscosity of the soft microgel particles decreases with decreasing temperature, and should be less than the rigid sphere value of 2.5, although the exact value could not be obtained due to lack of information of particle size at various temperatures and particle concentration. However, starting from the flow curves of the microgel dispersion at various temperatures and particle concentrations, the effective particle size can be obtained by various methods which includes the Buscall's EHS model. These were discussed. A modified lattice model was used to predict the shear modulus data for the soft microgel system and was found successful.