



P.13 Restricted diffusion of small probe particles in a laponite dispersion

S Kaloun¹, P M Klajner², P Hébraud² and J P Münch²

¹SAEED Ecole Supérieure de Technologie Essaouira, Université Cadi Ayyad, Morocco, ²I.P.C.M.S. UMR 7504, France

Evanescent wave microscopy is used to study the dynamics of probe particles inside a laponite suspension, when the size of the latex probes is of the order of the diameter of the laponite disks. A correlation procedure is introduced that allows us to study quantitatively the diffusion of small probes.

For all studied sizes, the motion exhibits two modes: a fast relaxation mode and a slow relaxation mode. In the fast relaxation mode, the probes diffuse in a viscous medium, whose viscosity does not depend on the diameter of the probes and is slightly larger than the viscosity of water. Then, the diffusion of the particles is restricted over distances larger than their diameters, which increase when the particle diameter decreases.

In this regime, the probe particles experience the elasticity of the solution and the apparent elastic modulus increases when the diameter of the probe particle increases, whereas for large enough particles, the macroscopic behavior is recovered, in which the diffusing particles experience a homogeneous medium, and the macroscopic elastic modulus is recovered.

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