Analysis of microstructure of silica/PVA suspension using scattering methods

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The particle/binder/solvent system is of great importance because of its broad usage in many processes. But adding particles to a viscoelastic fluid often leads to the formation of microstructure. Gel, which is complicated structure, is the one example. This gel structure is induced by the development of networks between the particles and polymers. The microstructural change may happen slowly during mixing because the interactions between particles and polymers might be developed for a long time. So they show time-dependent structural change, so called aging. It could be a reason of serious defects in processing. But it is not easy to explain exactly why they form networks and induce gel-like structure. because there are many variables which have to be considered altogether; mixing time, concentration of particle and polymer, pH and so on. So In this talk, By using Small Angle X-ray Scattering (SAXS) and Small Angle Light Scattering (SALS) experiment, we will analyze the microstructure of silica/PVA suspension during mixing. The effect of mixing time and concentrations of polymer on the suspension will be discussed.