Rheological behavior of PVA/CuNW suspensions with or without silica nanoparticle under the LAOS (Large Amplitude Oscillatory Shear) flow

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Poly vinyl alcohol (PVA) has been used by many coating companies. Because it has a high transparency, water soluble, non-toxic and low hygroscopic property. So it can be easily treated and have a long life time. The physical and chemical property of coating material is important to make sure the performance of film which is the final product of coating process. At this point, rheological analysis can represent its physical properties such as flow properties and Micro/Nano structure. In this study, Copper Nanowire (CuNW) and CuNW/silica suspension based PVA matrix were investigated by rheological properties, especially Small and Large Amplitude Oscillatory shear (SAOS and LAOS) test. Through the data from LAOS test, nonlinearity (third relative intensity) and Nonlinear Linear viscoelastic Ratio (NLR) can be calculated by the FT-rheology. In addition, degree of dispersion was figured out by simple optical method. So there could be relationship between NLR and morphology of film.