Microstructure and rheology of nanoparticles dispersed in immiscible polymer blends in printing process

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Dispersion of nano-sized particles at high solid content has attracted attention in many industrial applications such as printed electronic products. There are materials of complex fluids which are a broad range of structure from micro to nano and a limitation of the internal microstructure evaluation in complex flow field. We focused on the different printing profiles of the surface of Ni screen printing paste resulted from rheological properties of nano-Ni pastes and the stress development during drying with different composition of two immiscible polymer binders. From the interaction between particle-particle and fluid-particle, the complex Ni pastes with two binder mixtures showed nonlinear rheological behavior through high flow field on printing process. Stress development during drying was characterized the quantization of stress as a criterion drying behavior of Ni paste coating layer and after coating and drying, the film surface image was displayed inhomogeneous microstructure at various compositions of two binders.