**Drying of nonspherical Particle-Polymer-Composites**

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Presented at the 20th International Coating Science and Technology Symposium

September 20-23, 2020

Minneapolis, MN, USA

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Polymer-Particle Composites have great application potential in many technical coatings. The Particles in a Polymer Matrix can boost the properties of the coating solution and the dry film. Some examples are the suspension stability, the biocompatibility and the influence on the optical properties.

In this work aqueous polyvinyl alcohol (PVA) solutions and plate-like Glass-Flakes were used as coating suspension. This suspension was later used to produce thin transparent films in a drying channel, with different drying and coating conditions (e.g. drying speed, wet film thickness and particle concentration). The Glass-Flakes sedimentation rate and diffusion were obtained via light transmission. The results were fitted using the modified Batchelor and Perrin models, thus enabling a function to describe the concentration dependency of the sedimentation and diffusion of plate-like particles.

To predict the distribution of the particles in the dry film, a simulation model was developed. This model considers the diffusion and the sedimentation of the particles, the orientation they could have under a predetermined shear field during the coating process and the evaporation of the solvent. The model showed dependency on two main nondimensional numbers, the Peclet number (Pe) and the Sedimentation number (Ns). Plotting the results of the simulations with Pe as a function of Ns predicts 3 different drying regimes: Sedimentation, Diffusion and Evaporation.

In this study the geometry was changed, and the maps were redrawn to match the material system. The model validation was conducted using confocal Micro-Raman-Spectroscopy. With this technique it is possible to make a 3D imaging of the dry film and obtain the distribution of the particles as well as their morphology and orientation. The experimental results showed good concordance with the simulations.