

### A multiscale simulation of a colloidal film during drying process

Young Ki Lee<sup>†</sup>, Jae Hwan Jeong, Kyung Hyun Ahn

Seoul National University

(looka7652@snu.ac.kr<sup>†</sup>)

Drying of the colloidal film is encountered in many industrial applications, including fabrication of electronic devices and manufacturing of secondary batteries. The morphology of the dried film is closely related to the mechanical and electrical properties of the products, so controlling them is crucial in the fields. Typically, the colloidal film contains not only solid particles but also small additives to enhance the stability and properties. Although it has been reported that additives significantly affect the film morphology, the exact mechanism of them is partially unveiled yet. For further understanding them, we carry out a numerical study using a multiscale simulation approach. In the present study, we mainly focus on the roles of small additives in the evolution of film morphology. In the simulation result, we observe various types of morphology by tuning the affinities among components. Sometimes, additives are adsorbed on the surface of large particles or form the stratification layer. The obtained film morphology through the simulation looks similar to the experimentally observed one.