Drainage dynamics of continuous phase between cellulose surface and liquid interface

한성수, 김동우, 최시영†
한국과학기술원(KAIST)
(sqchoi@kaist.ac.kr†)

We present a hydrodynamical approach to interpret nanocellulose adsorption onto oil/water interface. In the process of particles being adsorbed on the oil/water interface, drainage occurs at the liquid film between the particle surface and the droplet. In order words, adsorption of nanocellulose on liquid interfaces can be approached hydrodynamically through the drainage model. Drainage, defined as the process of thinning until the liquid film thickness becomes the critical film thickness or film rupture. To find out the cause of their adsorptive nature, we compute the colloidal forces and drainage kinetics between the water droplet and the interface of nanocellulose based on the theoretical background. Using the calculated nanocellulose-interface interaction to the drainage model, we show the prediction of the drainage time through the profile of the liquid film. In this theoretical approach, the drainage time is used to evaluate the nanocellulose adsorption onto oil/water interface, which have a same tendency with experimental results from a model system.