

## Flow visualization of Slot Coating by Microchannel Experiment

박정원, 남재욱<sup>1,†</sup>

서울대학교; <sup>1</sup>서울대학교 화학생물공학부

(jaewooknam@snu.ac.kr<sup>†</sup>)

Various products, such as Li-ion Battery, Flexible display and Adhesive, are coated with functional thin film through the slot coating process. Coating solution consists of organic and inorganic particles and polymers. Because of microstructure which made with particles, the fluid shows yield stress. This yield-stress fluid's representative models are Bingham, Casson and Herschel-Bulkley model. These models and fluid mechanics equations are fitted with a yield-stress fluid in bulk region which is continuum. However, Coating is processed in micro-region which isn't guaranteed to be a continuum. So, it is important that find appropriate model with coating solution in micro-region.

In this study, a microchannel produced by polydimethylsiloxane(PDMS) is used to imitate the flow of slot coating. Battery slurry is yield-stress and shear-thinning fluid, so Carbopol which has similar properties to coating solution is chosen as model fluid. Carbopol is transparent so that flow inside the channel can be visualized and flow patterns in the slot coating can be predicted by velocity profiles.