

### Visualization and perception of the flow of a yield stress fluid in microchannel

박정원, 남재욱<sup>†</sup>

서울대학교

(jaewooknam@snu.ac.kr<sup>†</sup>)

A battery electrode is made by casting a slurry which consist of active material, conductive additive, and binder on metal foil. Slurry particles form a microstructure, which determines battery performance. Because slurry flow varies due to factors such as the concentration or flow rate which affects microstructure in coating process, so it is important to understand relationship between them. In addition, studies have shown that each part of electrode which is near to a separation film or a current collector with these two microstructures improves the performance of the electrodes. A two-layer coating allows this to be done at once. Since both fluids are coated at once, it is necessary to identify the phenomena and flow aspect between fluids for the quality of the product.

In this study, microchannel made of polydimethylsiloxane (PDMS) is used to mimic the phenomenon of slurry coating. Battery slurry has a yield stress and decreases viscosity as strain increases. By the analogy of this properties, Carbopol 941 is chosen as a model fluids. Carbopol 941 is transparent so that flow inside the channel can be visualized, which can predict flow of coating process in real industry.