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Studies on Rheology of E-printing Inks by μ -PIV in Microchannels YOUNG-SIK JANG, SIMON SONG, Hanyang Univ. — Using printing technologies for electronic circuits, such as antennas for radio frequency identification (RFID) chips, has been paid attention to recently in order to reduce production costs. In general, E-printing inks used for printed electronics have non-Newtonian properties because they contain metallic particles. Thus, it is important to investigate rheological behaviors of E-printing inks and suggest proper rheological models for developing printing devices for printed electronics. Also, the rheological models are necessary to accurately predict ink behaviors using CFD. However, classic methods to study rheological models are somewhat irrelevant since they require the mass consumption of expensive E-printing inks. Thus, to study rheological models suitable for commercial E-printing inks, we use microfluidic chips that only requires nascent E-printing inks. We measured flow velocities using μ PIV and pressure drops along the microchannel to determine a relationship between stress and strain rate of ink flows. We found that the E-printing inks exhibit shear-thinning behaviors. In the presentation, we will propose rheology models suitable for the E-printing inks.

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