

Effect of viscoelasticity of ink on Taylor cone jet in EHD jet printing

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Recently, electrohydrodynamic(EHD) printing is considered a promising tool for making nano-scale patterns as a demand for miniaturization of electronic devices increases. In EHD jet printing process, liquid droplet is formed in a strong electric field. The electric stress transforms the droplet into a conical shape, which is referred to as a Taylor cone. The diameter of Taylor cone jet can range from hundreds of micrometers down to several tens of nanometers. To obtain uniform and high resolution printing products, the prediction and control of the Taylor cone jet is very important. Therefore, in this study, we investigated the effect of physical properties of ink on Taylor cone jet with various operating conditions by using low viscous elastic fluids, which are suitable materials for EHD printing. The processing window was drawn to predict the operating conditions to achieve stable Taylor cone jet formation.