

Abstract Submitted
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Study on three-dimensional printing using electrohydrodynamic inkjet by analysis of mass flow rate¹ HAN SEO KO, SOO-HONG LEE, PIL-HO LEE, SANG WON LEE, Sungkyunkwan University — An electrohydrodynamic (EHD) jet can produce much smaller droplets than nozzle sizes even for highly viscous liquid. Micro scale patterns are produced by a direct patterning of the EHD inkjet printing technique to obtain lamination layers. A cone-jet mode shows good performance for line and surface printings. A prediction method for a flow rate was proposed by performing experiments and deriving an equation. The calculation was carried out by dividing the electric field and the fluid regions. Dielectric liquids were used as the working fluid, whose flow rate was measured at the applied voltage of 1.5kV to 2.5kV. The measured flow rate was affected by viscosity, surface tension, and density as fluid properties, and dielectric constant and electric conductivity as properties of electric fields for the voltage. Then, parameters of the printing were investigated by printed line width and thickness at various conditions. As a result, the applied static pressure had more effect on the line printing although the line width was affected by the stage velocity. The significant role of the parameters was confirmed to produce scaffolds using the three-dimensional EHD printing.

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