Numerical Study of Droplet Ejection Behavior for a Squeeze Type Piezoelectric Printhead

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ABSTRACT

Ink-jet are restriction the limited to the size of one micron of geometry，It is not easier to examine the flow field via the experiment amount，And set up a printhead equipment have need to consume a lot of time and repeated test experiment blackly，By imitate technology can is it gush out a printhead equipment with set up relevant to make purpose of technology set up with higher speed to achieve。Develop a can imitate the piezoelectic three-dimensional simulation system of computer of the ink-jet system drop producing , flight course in the course of printing in primary goal of this research. the theoretical formulation includes a set of three-dimensional transient conservation equations of mass and momentum, with the incorporation of continuous surface force model for treating the interfacial surface tension effect. The resultant governing equations are solved using an iterative SIMPLEC (Semi-Implicit Method for Pressure-Linked Equations Consistent) algorithm for determining the flow properties. Additionally, the VOF (Volume of Fluid) method in conjunction with the PLIC (Piecewise Linear Interface Construction) computation procedure is applied to characterize the behavior of liquid surface movement. The predictions are in reasonable agreement the experiment showing the validity of the present theoretical model. The flow and transport phenomena in various stages, including infusion, ejection, and droplet formation, are thoroughly examined in a new pattern squeeze type printheand.

Keywords : Piezo-actuated micro-injector ; Droplet ejection and formation process

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