Variation of flow rates with channel length in homogeneous and heterogenous micro-channel systems

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This study investigated the variation of flow rates in micro-channels, having homogeneous and heterogeneous systems, with various external voltages using three different micro-channel lengths such as 10, 20 and 30 mm. PDMS (polydimethylsiloxane) and negative photoresist (SU-8) were used to make the micro-channel by the soft lithographic method. In each case, several different external voltages were applied, viz. 0.1-0.45 kV. Our results indicate that flow rate increased with an increase of the external voltage at the same micro-channel length. It speculated that the electrical field is increased as the external voltage increased. For the same external voltage, the flow rate increased as the micro-channel length decreased.