

Abstract Submitted
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Mixing enhancement in a non-parallel microfluidic chip¹ FANG YANG, CUIFANG KUANG, WEI ZHAO, GUIREN WANG, NANO/MICRO FLUIDICS LAB, DEPT. ME UNIVERSITY OF SOUTH CAROLINA TEAM — Electrokinetic instability (EKI) flow can be used as an efficient tool for mixing in a lab-on-a-chip system. In this report, we fabricated a quasi-T channels with electrodes on the sidewall to enhance mixing with AC electrokinetics. A parametric study was conducted to explore the effectiveness of manipulating EKI waves to enhance fluid mixing inside the microchannel channel. Firstly, mixing results in two cases have been compared: electrodes are placed at the sidewall and electrodes are located at the ends of the channel. Secondly, the mixing results in the microchannel with different angle between two electrodes were assessed in terms of scalar concentration distributions. Thirdly, the effectiveness of the applied voltage phase variation between the two electrodes on the mixing process inside the quasi-T channel were also explored for the further mixing enhancement. Fourthly, mixing result under high frequency was also achieved. Finally fluorescent particles in one of the two streams were used to obtain a more clear visualization of mixing process in the microchannel with 5° angle between the two sidewalls.

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