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The Optimization Design of An AC-Electroosmotic Micro mixer¹ YANGYANG WANG, YONGKWEON SUH, SANGMO KANG, Dept. Mechanical Engineering, Dong-A University — We propose the optimization design of an ACelectroosmotic micro-mixer, which is composed of a channel and a series of pairs of electrodes attached on the bottom wall in zigzag patterns. The AC electric field is applied to the electrodes so that a fluid flow takes place around the electrodes across the channel, thus contributing to the mixing of the fluid within the channel. We have performed numerical simulations by using a commercial code (CFX 10) to optimize the shape and pattern of the electrodes via the concept of mixing index. It is found that the best combination of two kinds of electrodes, which leads to good mixing performance, is not simply harmonic one. When the length ratio of the two kinds of electrodes closes to 2:1, we can get the best mixing effect. Furthermore, we will visualize the flow pattern and measure the velocity field with a PTV technique to validate the numerical simulations. In addition, the mixing pattern will be visualized via the experiment.

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