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Abstract
Manipulation of particles was accomplished by a microfluidic device with SU-8 micropillars array based on dielectrophoretic (DEP) force and electroosmotic flow (EOF) in the present study. As applied a DC voltage on both ends of flow chamber, the particles could flow parallel to electric field driven by electroosmosis, in addition, a nonuniform electric field region was constructed due to the insulating SU-8 micropillars within the array, therefore, the bioparticles also could be trapped to the surrounding of micropillar possessed high or low electric field density, which depends on the polarization of particles and medium for moving particles by positive DEP or negative DEP. In order to optimized the design of micropillars array, two kinds of arrangement of micropillars array, in-line and stagger, and different diameters of cylindrical micropillar, 50μm, 100μm, 200μm, were simulated and fabricated by CFD-ACE and MEMS techniques, respectively. As the results, the smaller diameter of cylindrical micropillar produced the higher DEP force, furthermore, the in-line type micropillars array with bigger diameter resulted the faster flow velocity of electroosmosis flow.
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