

마이크로 유전 알고리즘을 이용한 삼각형 혼합요소를 갖는 Passive 마이크로믹서의 최적화

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Optimization of Passive Micromixer with Triangular-shaped Mixing Elements using Micro Genetic Algorithm

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Key Words: Micromixer(마이크로믹서), Micro Genetic Algorithm(마이크로 유전 알고리즘),
Mixing Efficiency(혼합성능), Pressure Drop(압력강하)

Abstract : Triangular-shaped mixing elements have been placed in the micromixer to improve the mixing. While the mixing elements improve the efficiency of the mixing, they increase the pressure drop. Hence, the micropump may fail to drive the fluids through the micromixers. In this study, a micro genetic algorithm is used to find an optimum design variables of the passive micromixer with triangular-shaped mixing elements and a weighted approach method is employed to investigate the multi-objective function problem. We have also found the pareto optimal solutions between the mixing efficiency and the pressure drop.

3차원 상변이 및 상호작용에 대한 Lattice Boltzmann 방법을 이용한 모사

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3D Simulation of Phase Transition and Interaciton by using Lattice Boltzmann Method

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Key Words: Phase Transition(상변이), Lattice Boltzmann Method, Cavity(캐버티)

Abstract : Lattice Boltzmann method is a new way of investigating the fluid flow which have been sovled by Naveir-Stokes equation numerically. It is known that making the single and parallel algorithms of the Lattice Boltzmann equation is easier than those of Navier-Stokes equations. Also, Lattice Boltzmann can simulate the two phase flow using either the "Interaction Potential model" introduced by Shan and Chen(1993) or "Red and Blue model" by Rothman et al.(1991). In this paper, we first compared the 3D cavity of Lattice Boltzmann method to Navier-Stokes equation for validation and show the 3D phase transition and its simple application by using the "Interaction Potential model"