

격자 볼츠만 방법을 이용한 미소 채널에서의 가스 유동에 대한 표면 거칠기의 영향

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Effect of surface roughness on gas flow in a microchannel by using lattice Boltzmann method

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Key Words: Laminar flow(층류유동), Microchannel flow(미소 채널 유동), Surface roughness(표면 거칠기), Friction factor(마찰 계수), Lattice Boltzmann Method(격자 볼츠만 방법), gas flow(가스 유동)

Abstract : Surface roughness is present in most of the microfluidic devices due to the microfabrication techniques. The paper presents lattice boltzmann method (LBM) results for gas flow of low Reynolds number in a microchannel with surface roughness modeled by a zigzag array of rectangular modules placed on two sides of a parallel-plate channel. In this study, passive scalar code in Lattice Boltzmann Method is used to simulate temperature field for gas flow of low Reynolds number in a microchannel.

스핀코팅 공정에서의 자유표면변형을 고려한 액적의 유동해석

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Droplet flow analysis with the free surface evolution in the centrifugal spin coating

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Key Words: Spin Coating(스핀코팅), Thin Film(박막), Free Surface(자유표면)

Abstract : In this study, the characteristics of droplet flow in the spin coating process considering the free surface evolution has been examined. Spin coating process is governed by the balance between centrifugal force, gravity force and surface tension force. Numerical simulation is performed by using the commercial CFD package. The numerical model is validated by comparing with experimental data of the initial droplet radius for the steady state and convective outflow radius in the spin coating process. The effects of the spin speed and the liquid property on the film radius, height and uniformity have been examined by varying the liquid volume. The film radius and uniformity increase with the speed of the spin and decrease with the viscosity coefficient for the same spin speed.