

원형관내의 액체 계면에 대한 전기습윤 현상의 동적 거동

정원영[†] · 강관형* · 이정목* (포항공대)**Dynamics of electrowetting for a liquid interface in a cylindrical tube**

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Key Words: Electrowetting(전기습윤), Liquid Lens(액체렌즈), Dynamic wetting(동적습윤), Surface tension(표면장력), Dynamic contact angle(동적 접촉각), Capillary(모세관)

Abstract : The contact angle of a meniscus and a droplet can be controlled by using electrowetting phenomena. We investigated the dynamic aspect of electrowetting for an oil-electrolyte interface formed inside a closed glass tube. A step input voltage is applied, and the subsequent motion of the interface is recorded by a high-speed camera. A kind of capillary instability is observed near the three-phase contact line, which could degrade the reliability of electrowetting devices such as the electrowetting liquid lens. The dynamics of interface motion for different input voltages and the fluid viscosities are analyzed and discussed based on the experimental results.

Non-equilibrium Molecular Dynamics of Nanojet Injection in a High Pressure Environment

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비평형 분자동력학을 사용한 고압하의 나노제트 붕괴 수치모사

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Key Words: Non-equilibrium Molecular Dynamics (비평형 분자동력학), Nanojet Injection and Breakup (나노제트 분사 및 붕괴), Critical Phenomena (임계현상)

Abstract : Using Non-equilibrium Molecular Dynamics, nanojet injection simulations have been conducted in a high pressure environment. To maintain a constant gas pressure, the periodic-shell boundary condition, which can produce a continuous gas flow with a constant temperature and velocity was used. A series of simulations were made with different chamber conditions from subcritical to supercritical pressure. Comparing the previous results from vacuum, high pressure effects accelerate jet breakup and droplet vaporization processes. Typical supercritical phenomena like the disappearance of phase interface and surface tension were also observed during the simulations.