

헬륨 버블링 방법을 이용한 액체 추진제 로켓 추진제 탱크의 가압 시스템 분석

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Analysis for Pressurization System of LOX Tank using GHe Bubbling Method in Liquid Propellant Rocket

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Key Words: GHe Bubbling Mehtod(가스 헬륨 버블링 방법), LOX cooling(LOX 냉각), Liquid Propellant Rocket(액체 추진제 로켓), Pressurization System(가압 시스템)

Abstract : This paper presents an analysis method to predict the temperature of LOX(liquid oxygen) and He(helium) contents in LOX at prepressurization and main pressurization stages using GHe(gas He) bubbling method for propellants feeding system in rocket. With presented analytical method in this paper, variation of temperature and He contents in LOX are predicted at prepressurization and main pressurization stages in case that GHe bubbling method is used in pressurization system of the 2nd stage. Computer simulations are accompanied in conditions of temperature(288K) and mass flowrate(0.02kg/sec) of injected He at prepressurization stage and in conditions of controlled pressure of tank(4bar) and fixed mass flowrate of fed LOX to engine at main pressurization stage.

전기삼투하에서 국소전압인가에 따른 유동양상의 변화

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Effect of a Local Electric Potential on the Flow Patterns under Electro-Osmosis

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Key Words: Electro-Osmosis(전기삼투), Local Electric Potential(국소전위)

Abstract : In a microfluidic chips pressure driven flow or electro-osmotic flow has been usually employed to deliver bio-samples. Flow in the chips is usually slow and the mixing performance is poor. A micro-mixer with a rapid mixing is important for practical applications. In this study a newly designed and electro-osmotic driven micro-mixer is proposed. this design is comprised of a channel and metal electrodes attached on the local sides surface. To investigate the flow patterns each metal electrodes are properly induced with electric potential. To characterize the flow field both numerical and experimental methods were employed. To obtain the velocity field three-dimensional numerical code, CFD-ACE. Ffocus is given effect on the electro-osmotic flows under the local variation of the electric potential.