

정밀한 용해도 측정 장치 개발을 위한 공리적 설계

김학빈[†](연세대) · 차성운*(연세대) · 이보형**(LG전선)**Axiomatic design of precious equipment for measuring solubility**Kim Hak Bin[†], Cha Sung Woon* and Lee Bo Hyoung**

Key Words: microcellular foaming process(초미세 발포), solubility(용해도), axiomatic design(공리적 설계), functional requirement(기능 요구사항), design parameter(설계 파라미터)

Abstract : Microcellular foam can be developed by first saturating a polymer sample with a volatile blowing agent, followed by rapidly decreasing its solubility in the polymer. New measuring solubility system is necessary for more accurate prediction solubility because old method is not precise. Therefore in this paper, we proposed new measuring solubility system design using axiomatic design tool. An axiomatic design is very useful and powerful design method. A comparison with old studies shows this new equipment to be more efficient and precise than the ones based on weighting the gas-saturated polymer under ambient conditions.

인치웜 방식을 이용한 고정밀 구동시스템의 개발

남권선[†](강원대 원) · 최종필*(강원대 원) · 김병희**(강원대)**Development of High Precision Actuator System by the Inchworm type**

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Key Words: Inchworm motor(인치웜모터), PZT(압전세라믹), FEM(유한요소해석)

Abstract : This paper presents the fabrication of inchworm motor for high precision actuator system of large displacement and high force. The inchworm motor consist of a extending actuator that provides displacement of tool guide, and two clamping actuators which provide the holding force. PZT element have low tensile strength and shear. So often fail under tensile and shear stress. To prevent failure, the pre-load housing was designed and fabricated to the optimal design condition according to the variation of the hinge stiffness by FEM(Finite Element Method) analysis. This is open-loop control and input voltage signals are three square wave of 50~60 percent duty cycles at each of the PZT elements. Also the dynamic characteristics of the system was verified by experiment results of the inchworm motor.