인조나노섬모 구현을 위한 탄소나노튜브(CNT) 성장용 나노패터닝 기술

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Nanopatterning technology for carbon nanotube growth in mimicking artificial nano-stereocilia

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Key Words: Nanopatterning(나노패터닝), Carbon nanotube(탄소나노튜브), Artificial nano-stereocilia(인조 나노섬모), Pattern replication(패턴복제)

Abstract : In this work, we have developed nanopatterning technologies for the fabrication of a synthetic nano-stereocilia. Various nanopatterning technologies including nanoimprint lithography, soft lithography, and focused ion beam (FIB) have been tried to pattern metal catalysts for carbon nanotube (CNT) growth. Catalyst nanodot patterns in the range from 50 nm to 200 nm could be obtained from these technology. Finally, Patterned structures for CNT growth with high asepct ratio which were similar to natural nanocilia were fabricated with the catalyst patterns.

나노 Hair 어레이 제작을 위한 사출 성형 기술 개발

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Injection molding of nano hair array

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Key Words : Nano hair(나노헤어), high aspect ratio(고세장비), injection molding(사출성형)

Abstract : High aspect ratio of nano hair array on a plastic substrate is injection molded using thermoplatic materials. The diameter of the hair molded is about 200nm and the length is 2um ~ 10um, so the aspect ratio is over 10. As a template for molding, two types of AAO(Aluminum Anodizing Oxide) plate are adopted. One is though-hole type of which the thickness is about 60um and another is intaglio hole type on the Al plate of about 2mm thickness. The overall dimension of the molded substrate with nano hair array on its surface is about 10mm for diameter and about 1mm for thickness. COC(Cyclic Olefin Copolymer) is used due to its good flowability and mechanical properties.