Fabrication of secondary structures for MEMS using AAO(Anodic Aluminum Oxide) nano-template

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Etching is a single, the most important unit operation in MEMS. It is directly connected to the precise fabrication of complex structures and the performance of microdevices. Major bottleneck in etching operation lies on the loss of anisotropy during the fabrication of microstructures of high aspect ratio. We report here that anisotropy can be easily maintained by using AAO(Anodic Aluminum Oxide) as a substrate for MEMS. This is because etching occurs in the lateral direction to the surface of a substrate by the etching solution inside the pores of an AAO. The proposed method consists of (1) preparation of an AAO substrate by anodic oxidation of pure aluminum, (2) evaporaition of an aluminum transfer layer on top of the AAO substrate, (3) spin coating of a photoresist layer on top of the aluminum transfer layer, (4) pattern generation by photolithography and (5) etching of unwanted parts with appropriate etching solutions. A variety of secondary structures were obtained with high anisotropy by using this technique.