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Nanofabrication Based on Nanoporous Membranes ZHEN WU, Northeastern University, L. TIAN, Texas Tech University, C. RICHTER, Northeastern University, D NAGESHA, Northeastern University, S. SRIDHAR, Northeastern University, L. MENON, Northeastern University — We describe nanofabrication methods to produce nanopore array templates in aluminum oxide and titanium dixode films. The method is based on anodization of thin films of aluminum and titanium under *dc* conditions in an acid. We also describe non-lithographic means of transferring the pore pattern from such nanoporous membranes onto a generic substrate. This is based on reactive ion etching through the nanoporous template grown directly on the substrate. In our demonstration, a thin alumina template consisting of a hexagonal array of pores ∼50nm in diameter is first deposited on the substrate. The pores reach within 10-20 nm of aluminum, which is protected by an alumina barrier layer. By controlling reactive ion etching conditions, we demonstrate highly anisotropic etching through the aluminum layer, barrier alumina layer and into the substrate. The 50nm pore layer is thus directly transferred to create nanoporous and nanopillar arrays of a variety of materials such as Al, Si, GaN, GaAs, etc. Such nanoporous, nanopillar arrays will be useful in a variety of applications involving biosensors, optoelectronic and spintronic devices.

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