

Formation of metal membranes by direct duplication of etched ion-track templates

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A method for direct electrochemical metal duplication of pores in ion-track polymer membranes is described. It allows fabrication of metallic membranes using any metal, which is readily deposited by electroplating from aqueous solutions. The metal is deposited on one side of the template membrane, facing the anode, which is made conductive by a thin metal cladding layer. During electroplating, the lateral tapping of the pores is prevented by applying a counter-solution from the opposite non-metallized side of the plastic membrane, which increases dramatically the deposition overvoltage in the vicinity of the pore orifices. Such metallic membranes can be generated with pore diameters in the nano- and micrometer range and with densities from single pores up to 10^6 - 10^7 pores/cm². They can replace plastic filters in cases when an application of polymer material is not desirable. They could be advantageous particularly in catalysis as well as in biological science and technology. Further, they may be useful as apertures and collimators for different kinds of radiation.