USING THE PLASMA CHEMICAL METHODS FOR DEPOSITION OF FLUORINATED POLYMER COATINGS ONTO TRACK-ETCHED MEMBRANE SURFACE

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The structure, surface and electrochemical properties of track-etched membranes from poly(ethylene terephthalate) with fluorinated polymer coatings obtained by plasma chemical methods have been studied.

The synthesis and properties of polymer composite membranes with hydrophilic porous substrate and hydrophobic top layer were studied. To prepare the composite membranes the fluorinated polymer films have been applied on one side of a poly(ethylene terephthalate) track-etched membrane used as a porous substrate. The plasma polymerization of 1,1,1,2-tetrafluoroethane [1], RF magnetron [2] and electron-beam sputter deposition of polytetrafluoroethylene [3] techniques were used for applying of polymer films onto membrane surface. The influence of the deposition time on the surface properties, chemical composition and wettability on both sides of the composite membranes is reported.

It was found that the application of such layers results in bilayer composite membranes with hydrophilic and hydrophobic sides. The surface roughness of the initial membrane changes in these processes. Besides, the deposition of a polymer film causes an essential narrowing the pores. The research of the electrochemical properties of the composite membranes has shown that the deposition of the hydrophobic polymer layer results in the creation of membranes featuring asymmetry of conductivity in solutions of electrolytes, which manifests itself at various orientations of membranes in an electric field. The principal cause of appearing the asymmetric conductivity is the changing the pore geometry due to the essential reduction of their diameter in the layer of the deposited polymer.

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