

The Interrelation of Synthesis Conditions and Wettability Properties of the Porous Anodic Alumina Membranes

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Аннотация: The results of studies on the wettability properties and preparation of porous anodic alumina (PAA) membranes with a $3.3 \pm 0.2 \mu\text{m}$ thickness and a variety of pore sizes are presented in this article. The wettability feature results, as well as the fabrication processing characteristics and morphology, are presented. The microstructure effect of these surfaces on wettability properties is analyzed in comparison to outer PAA surfaces. The interfacial contact angle was measured for amorphous PAA membranes as-fabricated and after a modification technique (pore widening), with pore sizes ranging from 20 to 130 nm. Different surface morphologies of such alumina can be obtained by adjusting synthesis conditions, which allows the surface properties to change from hydrophilic (contact angle is approximately 13°) to hydrophobic (contact angle is 100°). This research could propose a new method for designing functional surfaces with tunable wettability. The potential applications of ordinary alumina as multifunctional films are demonstrated.

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