

Characteristics of polyimide-based composite membranes fabricated by low-temperature plasma polymerization

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Abstract: Composite membranes were prepared by the deposition of plasma-polymerized allylamine films onto a porous polyimide substrate. The relationship between the plasma conditions and the membrane characteristics was described in terms of monomer flow rate, plasma discharge power, plasma polymerization time, and so on. Scanning electron microscope (SEM) images indicate that the thickness of the plasma polymer layer increased and the membrane skin pore size decreased gradually with the increasing of plasma polymerization time. Fourier transform infrared (FTIR) spectra demonstrate the appearance of amine groups in the plasma deposited polymer and the contact angle measurements indicate that the hydrophilicity of the membrane surfaces increased significantly after plasma polymerization. The composite membranes can reject salt from sodium chloride feed solution, and membrane separation performance depends strongly on the plasma conditions applied during the preparation of the plasma deposited polymer films. ?? 2007 Elsevier B.V. All rights reserved.

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