

Plasma modification of polyacrylonitrile ultrafiltration membrane

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Abstract: Polyacrylonitrile (PAN) ultrafiltration (UF) membranes were modified by plasma treatments and plasma polymerization. Influences of plasma modifications on membrane characteristics were investigated. The obtained results indicated that plasma treatments using non-polymer-forming plasma gases such as Ar, He and O₂ led to the increase of membrane surface hydrophilicity and membrane permeability. By using O₂ plasma treatment, UF property of PAN membranes could be improved with the enhancement of membrane flux meanwhile its albumin rejection was almost maintained. The experimental results also showed that plasma polymerization using acrylic acid vapor as monomer and PAN UF membrane as a substrate led to the formation of reverse osmosis membrane due to the deposition of plasma polymer layer onto substrate membrane surfaces. Plasma techniques can control membrane pore size and have a potential to improve the membrane characteristics by using their advantages. © 2006 Elsevier B.V. All rights reserved.

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