

# Membrane Characterization by Solute Transport using Ultraviolet Spectrophotometry and Gravimetry Methods

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## Abstract

Asymmetric polyethersulfone (PES) / polyvinyl alcohol (PVA) ultrafiltration (UF) flat sheet membranes were characterized by polyethylene glycol (PEG) transport using the UV spectrophotometry and gravimetry methods. The PVA membranes were prepared by coating a PES-UF membrane with PVA and crosslinking with sodium tetraborate (SB). The membranes were characterized in terms of pure water permeation (PWP), molecular weight cut-off (MWCO), solute separation and flux. Mean pore size ( $\mu_p$ ) and standard deviation ( $\sigma_p$ ) of the membranes were determined using PEG transport data. The MWCO of the membranes decreased when the membrane was coated with a PVA layer. In an attempt to find the more sensitive method, the results of two methods have been compared. PEG calibration curves were produced by UV analysis and were then used to determine the concentration of PEG in permeate and feed solutions.

*Keywords:* Ultrafiltration membranes, Polyethersulfone, Poly (vinyl alcohol), Molecular weight cut-off, pore size distribution.