



Effect of gradually varying baffled-ring distance on ultrafiltration in tubular membranes inserted concentrically with a ring rod

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ABSTRACT

The decline of permeate flux along the membrane ultrafilters is mainly due to the increment in concentration polarization resistance and the decline of transmembrane pressure. It was found that the concentration polarization resistance could be reduced in a ring-rod tubular membrane ultrafilter by the turbulent behavior. The performance will be further improved if the baffled-ring distances gradually and properly decrease along the cross-flow channel with fixed number of baffled rings. Theoretical analysis was based on the mass and momentum balances coupled with the application of resistance-in-series model. Correlation predictions are rather acceptable for higher feed concentration comparing with the experimental results for ultrafiltration of dextran T500 aqueous solution in a tubular ceramic membrane of a nine-ring rod insert with gradually decreasing the baffled-ring distances.

Keywords: Ultrafiltration; Tubular membrane; Baffled-ring distance; Ring-rod insert

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