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Polyamide 66 membranes with PVP addition prepared by phase inversion

Patrícia Poletto[a], Jocelei Duarte[a], Mônica B. Thürmer[a], Mára Zeni[a,b,*]

[a]*Center of Science and Technology, University of Caxias do Sul, 95070-560 Caxias do Sul, RS, Brazil*
Tel. +55 54 32182100; email: mzandrad@ucs.br
[b]*Caxias do Sul University, Box 1130, CED 95070-560, Caxias do Sul, RS, Brazil*

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ABSTRACT

The membranes prepared from synthetic polymer are used worldwide in separation processes. Polymeric membranes from polyamide 66 (PA 66) in hydrochloric acid (HCl) at the concentrations of 10 and 15 wt.% were prepared by phase inversion method. Poly(vinyl pyrrolidone) (PVP) was used as the polymeric additive in the casting solution to improve the morphology and properties of the PA 66 membranes prepared. The membranes analyzed by Fourier transform infrared (FTIR), maintaining the same chemical structure of pure PA 66 membranes, indicating that the PVP was eliminated in nonsolvent bath. The determination of cloud point showed that PVP addition promotes a thermodynamic instability in the casting solution, reducing the time precipitation and influencing in the dense layer formation of the membrane. The scanning electron microscopy (SEM) showed that the PVP addition promoted a decrease in the thickness of dense layer and an increase in the percentage of the porous sublayer, greater uniformity of pores membrane. The pure water flux membranes with PVP addition was higher than in membranes of pure PA 66. The pure water flux increases from 1365 to 2590 l $m^{-2} h^{-1}$ and from 66 to 362 l $m^{-2} h^{-1}$ at the concentration of 10 and 15 wt.% of PA 66, respectively.

Keywords: Polyamide 66 membranes; Poly(vinyl pyrrolidone); Phase inversion

*Corresponding author.

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