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Facile preparation of P84® polyimide affinity membrane with high adsorption of bilirubin

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ABSTRACT

In this work, polyimide (P84®) affinity membranes are prepared with P84® and different additive by facile phase inversion method. Polyethyleneimine containing numerous amino groups is grafted on the membrane for further amidation reaction with bilirubin carboxyl group. Organic additive polyvinylpyrrolidone and inorganic additive $La_{0.6}Sr_{0.4}Co_{0.2}Fe_{0.8}O_3$ nanoparticles are introduced to improve membrane performance. Effect of polymide concentration and additive content on the adsorption of bilirubin are investigated in detail. The morphology and structure of the membrane are characterized by scanning electron microscopy and atomic force microscopy. The results show that the polyimide affinity membrane prepared with 14 wt.% polyimide and 5 wt.% PVP has a significant effect on the specific adsorption of bilirubin. During the dynamic adsorption process, the P84® affinity membrane showed high bilirubin adsorption of 4.4 mg/g.

Keywords: Polyimide; Bilirubin; Polyethyleneimine; Adsorption; Affinity membrane

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