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Preparation and characterization of modified activated carbon/polysulfone blended ultrafiltration membrane

Yibing Ji, Jian Ke, Feifei Duan, Jianqiu Chen*

School of Science, China Pharmaceutical University, 24 TongJiaXiang, Nanjing, China, Fax +86 25 86185150, email: jiyibing@msn.com (Y. Ji), kejiancpu@163.com (J. Ke) 15605197789@163.com (F. Duan), cjqermembrane@163.com (J. Chen)

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ABSTRACT

Modified activated carbon with good adsorption performance and specific functional groups was prepared by oxidation of nitric acid and reduction of ammonium hydroxide. When the concentration of nitric acid and ammonia solution was 20%, the adsorption capacity of modified activated carbon was 226 mg/g and 266 mg/g, respectively. At the concentration of 10%, the modified active carbon have the highest content of acid group and basic group on the surface, which is 0.970 mmol/L and 0.315 mmol/L, respectively. Meanwhile, the composite ultra filtration membrane was prepared by filling the modified activated carbon into the polysulfone. It was found that the flux and rejection of the composite membrane were changed. The composite membrane filled activated carbon modified by the concentration of 20% nitric acid (PSF/HAC-20) could reach the highest water permeability of 116.5 $L \cdot M^{-2} \cdot h^{-1}$. Meanwhile, the retention rate was increased by 35% .

Keywords: Modified activated carbon; Polysulfone blended ultrafiltration membrane; Membrane flux; Rejection rate

*Corresponding author.