

Poly(vinyl pyrrolidone)-enhanced crossflow filtration of Fe(III), Cu(II) and Cd(II) ions using alginic acid/cellulose composite membranes

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ABSTRACT

Removal of Fe(III), Cu(II) and Cd(II) ions from aqueous solutions was studied by polymer-enhanced crossflow filtration. Poly(vinyl pyrrolidone) (PVP) was used as complexing agent to enhance the retention. Alginic acid (AA)/cellulose composite membranes were used in the separation. The effects of AA content of the membranes and pH of the solution on the retention efficiency and the permeate flux were examined. Maximum retention efficiency was found as 93% for 1×10^{-4} M Fe(III) solutions at a flow velocity of 100 mL/min, pH of 3.0, pressure of 10 kPa in the presence of PVP by using 0.50 (w/v)% AA/cellulose composite membranes whereas for 1×10^{-4} M Cu(II) and Cd(II) solutions the maximum retention efficiencies were found as 98% and 81% respectively at pH 7.0.

Keywords: Composite membranes; Complexation; Crossflow filtration; Metal removal; Poly(vinyl pyrrolidone)

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