

The Elimination of Cadmium(II) from Aqueous Environment by Supported Liquid Membrane Method Using the Basic Carrier

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Abstract. The transport of cadmium ions through a supported liquid membrane containing triethanolamine (TEA) as a mobile carrier has been studied. The effects of Cd(II) concentration, HCl in feed and carrier concentration in membrane have been studied. Cd(II) concentration in feed leads to an increase in flux from $2.1 \cdot 10^{-7}$ to $8.4 \cdot 10^{-7}$ mol cm⁻² sec⁻¹ within Cd(II) ions concentration range ($2.7 \cdot 10^{-4}$ M - $16.3 \cdot 10^{-4}$ M) at 2.0 M HCl in the feed and 3.0 M triethanolamine in the membrane. Increase in H⁺ ion concentration from 0.5 M to 3.0 M results in an increase in Cd(II) ions flux but a decrease is observed beyond 2.0 M HCl concentration in feed. Increase in carrier concentration in the liquid inside the membrane enhances the flux with its maxima at 3.0 M carrier. Further increase in the concentration of TEA leads to a decrease in transport due to increase in viscosity of membrane liquid. The optimum conditions for Cd(II) ions transport are, 2.0 M HCl in feed, 3.0 M TEA in membrane and 0.1 M NaOH as strip solution. Similar transport characteristics have been observed for Cd-EDTA complexed anions across TEA-cyclohexanone based SLM, thus indicating a cadmium anion transport coupled with protons and chloride or EDTA co-ions.