# Removal of Potassium Chloride from Ion-Exchanged Solution Containing Potassium Clavulanate by Diafiltration with Nanomembrane and Its Modeling

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When an ion-exchange chromatography process is employed for the recovery of potassium clavulanate (KCA) from fermentation broth, the resulting KCA solution usually contains a large amount of KCl due to the use of a concentrated elution buffer. In this study, nanofiltration (NF) with NF200 membrane has been carried out in a diafiltration mode to remove KCl from the ion-exchanged KCA solution, and a multistage version NF model reflecting clavulanate degradation has been proposed to represent this process. For the determination of model parameters associated with NF and clavulanate degradation, separate series of experiments were performed. The clavulanate rejection could be assumed to be constant. The chloride rejection was represented as a function of its concentration simply by nonlinear fitting. For the estimation of solution flux, the reflection coefficient and effective volume charge density were calculated by the Speigler-Kedem model and the Teorell-Meyer-Sievers model. Model prediction of clavulanate and chloride concentration profiles was in good agreement with the experimental data.