Development of Capacitive Deionization Process for Removal of Zinc Chloride

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The capacitive deionization (CDI) method is first applied to remove zinc chloride from the mixture of zinc chloride and insulin, which are the typical metabolites from the microbial fermentation based on recombinant DNA technology. In this study, we optimized the important process parameters of capacitive deionization to remove of zinc chloride. The optimal electrical voltage, operation time, and flow rate were 1.4 V, 3 min, and 20 mL/min, respectively. Under the optimal conditions, the removal of zinc chloride was 88%, 79%, and 69% at the initial zinc chloride concentration of 180 mg/L, 360 mg/L, and 540 mg/L, respectively. The capacitive deionization (CDI) process as an effective method for the zinc chloride removal is expected to replace the existing size-exclusion chromatography, which is the typical process for removal of zinc chloride.