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# Electrochemical impedance spectroscopy and surface properties characterization of anion exchange membrane fouled by sodium dodecyl sulfate

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## Abstract

In this study, the fouling of anion exchange membrane (AEM) in electro dialysis was investigated using sodium dodecyl sulfate (SDS) as a model foulant, and the effect of membrane cleaning on the properties of the fouled AEMs was examined further. Results showed that the severer fouling of AEM was caused by the higher concentration of SDS in the feed solution, and a dense SDS fouling layer was formed on the AEM surface, causing the obvious increase of electrical resistance and the deterioration of desalination performance. Electrochemical impedance spectroscopy (EIS) indicated the SDS fouling layer on the AEM could hinder, even restrict completely the transmembrane migration of the ions, especially at high concentration of SDS. The cleaning experiment showed the cleaning effect of ultra-pure water was similar to that of HCl solution, but was better than that of NaOH solution, in which most SDS on the fouled AEM could be removed effectively by cleaned in ultra-pure water. EIS of the fouled AEMs before and after cleaned indicated that the remaining SDS on the cleaned AEM had almost no influence on the transmembrane migration of the ions through AEM.

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