

Quantitative Evaluation of the Partition Coefficients of Solutes between Polyamide Active Layers of RO Membranes and Water Using Quartz Crystal Microbalance

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Summary

The objective of this study was to measure the charge density in polyamide active layer of a commercial reverse osmosis membrane. To achieve this objective, cesium ion (Cs^+) was chosen as a counter ion of deprotonated carboxy group (R-COO^-), and the mass of Cs^+ that associates with R-COO^- was measured with a quartz crystal microbalance (QCM). Experimental data showed that the charge density obtained in this study at the pH range between 4.0-9.0 was in good agreement with those obtained with an existing method using Rutherford backscattering spectrometry (RBS). RBS is a powerful but not easily accessible technique. Therefore, the method investigated in this study can be used as a relatively easy and simple way that permits one to measure the charge density of polyamide active layer.