

# Tracer diffusion and activity coefficients of counterions in aqueous solutions of polyelectrolytes

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Tracer diffusion coefficients of  $\text{Ag}^+$  in silver polystyrenesulfonate and counterion activity coefficients of sodium and silver polystyrenesulfonates have been determined at different concentrations. The results have been analyzed using a simple electrostatic model which assumes the polyions to be parallel sheets of uniform charge density distributed in the volume of the solution. This model enabled the derivation of a relationship between tracer diffusion and activity coefficients of counterions. Data for sodium dodecyl sulfate and partially neutralized polyacrylic acid were also examined. The activity coefficients of the counterions in the polyelectrolyte solutions were calculated from the theoretical relationship between activity and tracer diffusion coefficients, with the experimental values for the tracer diffusion coefficients. According to the model employed, if the distance between adjacent charged groups on the chain is constant, activity and tracer diffusion coefficients should