Ion Selective Permeability in Charged Cellulosic Membranes

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The sorption and permeation in solutions of alkali metal chlorides, tetraalkyl ammonium chlorides and inorganic metal salts at 25°C were investigated.

The membranes used were partially carboxyethyl cellulose, sulfoethyl cellulose.

The type of isotherms was partition and the permeation coefficients were found to increase in a sequence of $KCl > CsCl > NaCl > LiCl$ and $(CH_3)_4NCl > (C_2H_5)_4NCl > (C_4H_9)_4NCl$. This sequence is explained by considering the partition and the hydration of the ions in these hydrophilic membranes.

The dependence of the permeability on the salt concentration was interpreted by means of TMS theory. The effectiveness of the charged group in these membranes is explained by the counterion binding mechanism. The fixed charged density was found to depend on the ionic species.

The ionic mobility ratio in these membranes showed the same dependence on the Stokes radius of the cation as that in the bulk aqueous solution.