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Electrokinetic Potentials at Liquid Surfaces

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THE DETERMINATION OF THE DIELECTRIC CONSTANTS OF AQUEOUS SALT SOLUTIONS AT ULTRA HIGH FREQUENCIES

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The determination of the dielectric constants of aqueous salt solutions is accomplished by an adaptation of the method used by Paul Drude in 1897. A stable ultra high frequency vacuum tube oscillator is used to produce standing waves in an inductively coupled Lecher wire system. The wave length used is 123 cm. The resonant point on the parallel wires, crossed by a condenser containing the salt solution, is used to measure the dielectric constant.

The results obtained with KCl and K_2SO_4 solutions indicate that interesting and reliable results may be expected even for good conductors.

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ELECTROKINETIC POTENTIALS AT LIQUID SURFACES

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Aqueous solutions of potassium chloride were allowed to flow through air. The solutions were from 10^{-1} N to 10^{-7} N. The hydrostatic pressure was from 23 to 80 cm. of solution. The flow was vertical and laminar, through a circular aperture in a thin platinum disc on to a second platinum disc. The diameter of the aperture was 0.05 cm. The discs served as electrodes. The potential difference was measured with a vacuum tube potentiometer. A F. P. 54 G. E. tube was used, so the potential difference was measured with essentially no current flow.

The data obtained indicated that ballo-electric effects might be avoided by allowing the waste liquid to touch the lower electrode. The shielding of major importance was that around the vacuum

tube. The data seemed to show that if a streaming potential was being measured, it was not the only potential being measured. The emf was not proportional to the hydrostatic pressure. This might have been due to the measurement of a streaming potential affected by slippage of the outer part of the double layer.

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