ture. Analyzing the situation in these diaphragms, the authors come to the conclusion that a hydraulic effect should practically not arise when they are produced from narrow fractions, and that Overbeek's conclusion (that reliable $\zeta$ potentials cannot be obtained from the results of electroosmotic experiments at electrochemically active powder diaphragms) is at least too categorical as applied to such diaphragms.

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*15 pages with illustrations, bibliography: pp. 14/15, 9 citations.
Original article filed at VINITI (No. 3506-75), December 10, 1975.

## DEDUCTION OF ELECTRICAL EQUIVALENT CIRCUITS FROM THE FREQUENCY CHARACTERISTICS OF ELECTRODE IMPEDANCE*

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UDC 541.13

The computer programming procedure by which one can synthesize the electrical equivalent circuit of a given form for electrode impedances is described. Only the use of experimental values for the active component of electrode impedance is specified in the program. The least square method is used in searching for the values of parameters entering the approximating function nonlinearly. It was seen by testing the program with an arbitrarily selected model circuit consisting of seven frequency-independent elements that the values of the active and reactive impedance components of synthesized and model circuits coincide with a mean relative error not exceeding 0.3%. The substantial difference of these circuits indicates that the solution of the problem is ambiguous, so that in any real case one must find all possible equivalent circuits; the number of these circuits can be reduced with increasing accuracy of the measurements.

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*15 pages with illustrations, bibliography: p. 12, 7 citations.
Original article filed at VINITI (No. 3509-75), December 10, 1975.

## ADSORPTION OF SOME ORGANIC COMPOUNDS AT NICKEL AND THEIR INFLUENCE ON THE KINETICS OF ELECTROCHEMICAL REACTIONS IN ACIDIC SOLUTIONS*

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The adsorption of organic cations (tetrabutylammonium sulfate, tribenzylmethylammonium sulfate, tribenzylamine), anions (sodium sulfosalicylate, potassium benzenesulfonate) and neutral substances (hexyl alcohol, caproic acid) from 1 N $H_2SO_4$ solutions was studied at the nickel electrode by the method of recording differential-capacity curves as function of potential.

Polarization curves were used to study the influence of the adsorbing surfactants on the kinetics of the electrochemical reactions occurring at the nickel electrode in 1 N $H_2SO_4$. The neutral surfactants are weakly adsorbed on Ni, but stronger than on Fe. During adsorption they retard the electrochemical reactions being studied. Organic cations inhibit the cathodic reaction of hydrogen evolution, and the anodic reaction of nickel ionization. The sulfonic acid anions accelerate the cathodic, and retard the anodic reaction. The effect of halide ions on the adsorption of the organic surfactants was studied. It was seen that the adsorption of halide ions acts so as to promote the adsorption and the effect of cationic surfactants. A synergetic effect is seen in the case of $I^-$ ions.

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