A METHOD TO DETERMINE ADSORPTION ON ELECTROCATALYSTS

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The direct method of determining hydrogen adsorption on electrodes which has been suggested previously [1] and verified quantitatively on platinum [2] can be extended to measure the adsorption of other materials. After attaining steady-state adsorption at a given value of potential, the cell is washed with base electrolyte solution in inert-gas atmosphere. Then the lower part of the cell described in [1] is heated, at open circuit, in the flow of another gas which will transfer the adsorbate into the gaseous state. For instance, in a determination of the amount of adsorbed, carbon-containing species, it will be convenient to select O_2 as the carrier gas, which will oxidize all these species to CO_2. For an analysis of adsorbed species which contain N, S, and other atoms, H_2 can be used as the carrier gas. During the heating, all gas is collected into a measuring vessel, and then analyzed for the concentration of the component to be determined, which is best done chromatographically. This method inherently contains certain limitations of the electrooxidation (reduction) in adsorbed layers, but its advantage is the lack of assumptions as to the amount of charge to be subtracted for the electrode without adsorbate, and as to the number of electrons required for the oxidation (or reduction) of the chemisorbed species. In addition, the method can be applied to electrodes where it is difficult or impossible to obtain reproducible charging curves (Fe, Ni, Co, and others).

LITERATURE CITED

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2. V. Sh. Palanker, B. B. Dyusenbina, and E. N. Baibatyrov, Élektrokhimiya, 13, 121 (1977).

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