

THE EFFECT OF ULTRAVIOLET IRRADIATION ON THE PROCESSES OF ELECTROOXIDATION OF HYDROGEN SORBED ON PALLADIUM DEPOSITS

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Stripping voltammetry is used by us to study the effect of ultraviolet (UV) irradiation on the kinetics of the processes of electro-oxidation of hydrogen adsorbed by the electrolytic deposit of palladium and absorbed by the palladium deposit on the surface of a graphite electrode (GE).

From the literature data it is known that in acidic background electrolytes at the limit current potential of palladium(II) ions there is a conjugated process of electrodeposition of hydrogen and palladium.

During the electrooxidation of the deposit, a curve with multiple peaks of current is recorded on the voltammogram. In the potential range of 0.1...0.3 V, selective electrooxidation of hydrogen adsorbed on palladium precipitate occurs; at potentials of 0.4...0.6 V, selective electrooxidation of hydrogen from palladium absorbed by the deposit and electrooxidation of palladium occurs. The kinetics of electroreduction of palladium together with hydrogen without UV and with UV irradiation of solution is considered. The study of the kinetics of the solid-phase process of electrooxidation of hydrogen from palladium was carried out using the Abraham equation, on the temperature dependences of the logarithm of the current on the reciprocal temperature, on the basis of phenomenological dependence of hydrogen desorption from palladium surface on UV irradiation time.

It is established that the process of electrooxidation of hydrogen absorbed by palladium is limited by the diffusion of hydrogen from palladium. Determined kinetic parameters of adsorption processes of hydrogen by electrodeposits of palladium and processes, desorption of hydrogen from the electrolytic precipitation of palladium (the heat of hydrogen adsorption, the rate constants of hydrogen desorption, the diffusion coefficient of hydrogen absorbed by the palladium deposit).