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Probing Absorption of Deuterium into Palladium Cathodes During D2O Electrolysis with an In Situ Electrochemical Microbalance Technique

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Abstract:

The in situ observation of the absorption of deuterium (or hydrogen) into the Pd cathode during D2O (or H2O) electrolysis was made by an electrochemical microbalance technique which is based on the quartz-crystal electrode. The resonant frequency of the Pd-coated quartz-crystal electrode decreased with increasing amount of charge passed during electrolysis, and the frequency change for the D2O electrolysis was about twice that for the H2O electrolysis. The atom ratios of H/Pd and D/Pd of the H-Pd and D-Pd compounds resulting from the electrolysis were estimated to be 0.59 and 0.57, respectively.

Keywords:

D2O electrolysis / deuterium absorption / Pd cathode / in situ electrochemical microbalance technique