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## **Probing Absorption of Deuterium into Palladium Cathodes During D<sub>2</sub>O 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 D<sub>2</sub>O (or H<sub>2</sub>O) 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 D<sub>2</sub>O electrolysis was about twice that for the H<sub>2</sub>O 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:**

D<sub>2</sub>O electrolysis / deuterium absorption / Pd cathode / in situ electrochemical microbalance technique