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Hydrogen Transport Coupled with Transport of Alkaline Cation and Neutral Species through Ni(OH)₂/NiOOH Film Electrode

Ni(OH)₂/NiOOH 박막 전극을 통한 알칼리 양이온과 중성 분자의 이동과 결합된 수소 이동에 관한 연구

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The hydrogen transport coupled with the transport of alkaline cation and neutral species through the Ni(OH)₂/NiOOH film electrode has been investigated in 0.1 M LiOH, KOH and CsOH solutions by using potentiostatic current transient technique combined with electrochemical quartz crystal microbalance (EQCM) technique. From the ohmic relationship between initial current density and applied potential step, it is suggested that the hydrogen transport through the film electrode is exclusively governed by 'cell-impedance'. Based upon the 'cell-impedance controlled' hydrogen transport, the mass change measured indicates that during the hydrogen extraction, the alkaline cation is slowly inserted into the film electrode before the finish of current plateau. After the period of current plateau is finished, it is drastically inserted in an exponential rate. By contrast, during the hydrogen injection, the desertion of alkaline cation is nearly completed before the finish of current plateau. Most of the neutral species are incorporated into the film electrode during the preceding immersion stage prior to the hydrogen extraction. The minority is not incorporated until the finish of current plateau during the succeeding hydrogen injection.

References

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2. J.-W. Lee, J.-N. Han, M. Seo and S.-I. Pyun, submitted to *J. Solid State Electrochem.* for publication (2000).