

Preparation of LaNi_5 Layers by Electrodeposition Using Molten Salt and Anodic Polarization Characteristics after Hydrogen Charge

Yuya SUTO*, Naka SATO**, Michihisa FUKUMOTO** and Motoi HARA**

*Graduate School of Engineering Science, Akita University, Akita 010-8502, Japan

**Department of Materials Science, Graduate School of Engineering Science, Akita University, Akita 010-8502, Japan

E-mail: haramoto@gipc.akita-u.ac.jp

The preparation of a surface layer consisting of LaNi_5 , which is a hydrogen storage alloy, was attempted by the electrodeposition of La on a Ni substrate using molten NaCl-KCl containing LaF_3 as the electrolyte. The La electrodeposition was carried out by potentiostatic polarization in the potential range lower than -2.2 V (vs. Ag/AgCl(0.1)) in the molten salt at 1023~1198 K. The deposited layers consisting of LaNi_5 were uniformly formed by polarization at potentials between -2.2 and -2.25 V in the molten salt at 1073~1123 K. The anodic polarization curves after the hydrogen charge of the specimens with the deposited layers were measured in a 10 mass% KOH aqueous solution. For the curves, an anodic current peak due to the oxidation of hydrogen was observed. The highest current peaks were observed for the specimens with the deposited layer consisting only of LaNi_5 . The value of the anodic current peak for the specimen with the deposited layer consisting only of LaNi_5 was higher than that for the LaNi_5 specimen prepared by argon-arc melting.

Keywords : Hydrogen storage alloy, Surface layer, LaNi_5 , Electrodeposition, Molten salt, Anodic polarization, Oxidation of hydrogen