

Letters of Interest Submission



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Electrochemical study of A2B7-type hydrogen storage alloy prepared by ball milling

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Abstract. In this study, the hydrogen storage property of the La_{1.5}Mg_{0.5}Ni₇ compound as a negative electrode in Ni-MH batteries was investigated. This compound was elaborated by ball milling in a mechanical grinder for 30 hours at a ball/powder weight ratio of 8:1. The characterization of the powder of the elaborated alloy was examined both by X-ray diffraction and by scanning electron microscope.

In this context, the structural property for alloy has two major phases Ni, La₂Ni₇. The powder micrograph shows that the average grain size calculated is approximately 13 μm .

The electrochemical characterization of the La_{1.5}Mg_{0.5}Ni₇ electrode was carried out by the galvanostatic charge and discharge polarization the open circuit potential and potentiodynamic polarization in alkaline solution (6M), and at ambient temperature..

The best discharge capacity is observed in the first cycle (58 mAh/g). Therefore the La_{1.5}Mg_{0.5}Ni₇ alloy activation requires only one cycle of charge and discharge. After activation, the discharge capacity gradually decreases during long cycling because of the degradation of the active material of the electrode.

Keywords: A2B7-type hydrogen storage alloy; Mechanical alloying, nickel-metal hydride batteries, electrochemical polarization Methods.

Primary Category

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Secondary Category

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