Short Communication

The Effect of Melt spun Treatment on the Properties of La₄MgNi₁₇Co₂ Hydrogen Storage Alloys

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The La₄MgNi₁₇Co₂ hydrogen storage alloys were prepared by induction melting, and the effect of melt spun treatment on the phase structure and electrochemical properties of the alloys were systematically investigated. The XRD analysis showed that all the alloys consist of (La,Mg)₅Ni₁₉ phase and LaNi₅ phase. Higher rapid solidification rate is beneficial to the formation of A₅B₁₉ phase. The electrochemical measurements showed that all the alloys have good activation performance (in 2 cycles) and high rate discharge-ability (HRD₆₀₀>87%). Higher rapid solidification rate can also improve the maximum discharge capacity (C_{max}) and capacity retention rate (S₁₀₀), such as the 25m/s alloy, S₁₀₀ = 71.27%, C_{max} = 345.25 mAh/g. It is found that the C_{max} variation of alloy electrodes are related with the phase abundance and cell volumes (V) of the two phases, and the improvement of cycling stability is due to the increasing of anti-pulverization of the alloys treated by melt spun method.

Keywords: hydrogen storage alloy; A₅B₁₉-type; crystal structure; electrochemical property; La-Mg-Ni system

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