Poster Presentation

MM.P11

Hydrogenation properties of as quenched Ti45Zr38Ni17 quasicrystalline alloys

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The present study deals with the microstructural changes with respect to the processing parameter (quenching rate) and their correlation with hydrogen storage characteristics of Ti45Zr38Ni17 quasicrystalline alloys. The ribbons of the alloy have been synthesized at different quenching rates obtained through different wheel speeds (35, 40, 45 and 50 m/s) and investigated for their hydrogen storage characteristics. The lower cooling rate obtained through low wheel speed (35 m/s) produces, i-phase grains whose size ranges from 300- 350 nm, whereas higher cooling rates obtained through high wheel speed (45 and 50 m/s) promote the formation of grains with size ranges from 100-150 nm in Ti45Zr38Ni17 ribbons. It has been found that the ribbons synthesized at 35 m/s absorbed ~2.0 wt%, whereas ribbons synthesized at 50 m/s absorbed ~2.84 wt. % of hydrogen. Thus the hydrogen storage capacity of ribbon increases for the ribbons produced at higher quenching rate. One of the salient features of the present study is that the improvement of hydrogen storage capacity obtained through higher quenching rates (~45 to 50 m/s wheel speed) leading to the formation of lower grain size.

Keywords: Hydrogen Storage, Quasicrystalline, peak fitting