

Hydriding and Dehydriding of Mg₂Ni-AB Nanocomposites

Synthesized by Ball Milling

Z. Zlatanova, T. Spassov, M. Spassova

Faculty of Chemistry, University of Sofia “St.Kl.Ohridski”, 1164 Sofia, Bulgaria

E-mail: nhtzz@chem.uni-sofia.bg

The present work deals with the hydriding and dehydriding of Mg₂Ni-AB (AB = TiFe and TiNi) nanocomposites, prepared by mechanical milling. The as-produced composites are characterized using x-ray diffraction and electron microscopy. The morphology, microstructure, thermal behavior and the possibility for hydriding and dehydriding of these materials are systematically studied. Different synthetic conditions are applied with the aim to optimize the hydrogen storage properties of the composites.

The hydriding ability of the materials is determined using two methods – electrochemical hydrogen charge/discharge and differential scanning calorimetry under hydrogen pressure. A number of experimental conditions are varied, incl. temperature, pressure, charge/discharge current density etc. The parameters, which have the most significant influence on the hydriding process are defined and confirmed. The gas phase analysis reveals very low temperatures of the composites hydrogenation. The results obtained allow us to make some essential conclusions for the hydriding processes of this type of composites.