Hydriding Properties of MgH_2-$Mg_2Ni_{0.8}Co_{0.2}$ Composites Obtained by Ball Milling

Tsveta Mandzhukova[a], Jean-Louis Bobet[b], Maria Khrussanova[a], and Pavel Peshev[a]

[a] Institute of General and Inorganic Chemistry, Bulgarian Academy of Sciences, Acad. G. Bonchev Str., Building 11, 1113 Sofia, Bulgaria
[b] Institut de Chimie de la Matière Condensée de Bordeaux (ICMCB), CNRS, (UPR 9048), Université Bordeaux 1, 87 Avenue du Docteur A. Schweitzer, 33608 Pessac Cedex, France

Reprint requests to Ts. Mandzhukova. Fax: +359 2 8705024. E-mail: tsvetam@svr.igic.bas.bg

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The hydrogen absorption-desorption characteristics of composites consisting of 90 wt. % MgH_2-10 wt. % $Mg_2Ni_{0.8}Co_{0.2}$ prepared by ball milling for 30 and 180 min under argon have been investigated. The results obtained have been compared with those for the 90 wt. % Mg-10 wt. % $Mg_2Ni_{0.8}Co_{0.2}$ composite synthesized in the same medium after 30 min of milling. The presence of the $Mg_2Ni_{0.8}Co_{0.2}$ phase has been found to improve the hydriding kinetics of magnesium, the absorption capacity remaining high at temperatures below 573 K. The use of magnesium hydride instead of magnesium has proved to have a favorable effect on the properties of the composites after prolonged activation in an inert medium. It has been established that the absorption-desorption characteristics of the composite 90 wt. % MgH_2-10 wt. % $Mg_2Ni_{0.8}Co_{0.2}$ activated mechanically for 180 min are comparable with those of the composite 90 wt. % Mg-10 wt. % $Mg_2Ni_{0.8}Co_{0.2}$ after mechanical activation for only 30 min. The favorable absorption-desorption characteristics of the composites have been explained with the catalytic effect of the additive, the presence of magnesium hydride and the duration of ball milling.

Key words: Hydrogen Storage, Magnesium Composites, Ball Milling, Intermetallic Additives