

عنوان مقاله:

Synthesis of a nanostructured MgH₂-5 wt% Ti-Mn-V-Fe composite for hydrogen storage via combined VAR and mechanical alloying

محل انتشار:

چهارمین کنفرانس بین المللی رویکردهای نوین در نگهداشت انرژی (سال: 1393)

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خلاصه مقاله:

In this study, the composite material with composition of MgH₂-5wt%Ti-Mn-V-Fe has been prepared by co-milling of MgH₂ powder with TiMn_{1.4}V_{0.46}Fe_{0.16} alloy powder. To prepare the alloy, vacuum arc remelting (VAR) method was applied and then the bulk was milled to reach mesh-325 alloy powders. The effect of milling time and additive on the hydrogen desorption properties of obtained composite was evaluated by thermal analysis method. The phase constituents of powder particles were characterized by X-ray diffraction method. It has been shown that addition of 5 wt% TiMn_{1.4}V_{0.46}Fe_{0.16} to MgH₂ and mechanical alloying (MA) up to 30 h formed a nanocrystalline composite with the average crystallite size of MgH₂ of 3 nm and lattice strain of 0.8 %, using Williamson–Hall method. As a consequence, the desorption temperature of composite material milled for 30 h has decreased to 363 °C from 421 °C.

کلمات کلیدی:

Hydrogen Storage, Magnesium hydride, Mechanical alloying, Hydrogen desorption temperature

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