

Accepted Manuscript

Milling effect on the microstructural and hydrogenation properties of TiFe_{0.9}Mn_{0.1} alloy

Ali Zeaiter, David Chapelle, Fermin Cuevas, Anne Maynadier, Michel Latroche



PII: S0032-5910(18)30723-X
DOI: doi:[10.1016/j.powtec.2018.08.085](https://doi.org/10.1016/j.powtec.2018.08.085)
Reference: PTEC 13670
To appear in: *Powder Technology*
Received date: 23 April 2018
Revised date: 13 July 2018
Accepted date: 30 August 2018

Please cite this article as: Ali Zeaiter, David Chapelle, Fermin Cuevas, Anne Maynadier, Michel Latroche , Milling effect on the microstructural and hydrogenation properties of TiFe_{0.9}Mn_{0.1} alloy. Ptec (2018), doi:[10.1016/j.powtec.2018.08.085](https://doi.org/10.1016/j.powtec.2018.08.085)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Milling effect on the microstructural and hydrogenation properties of $\text{TiFe}_{0.9}\text{Mn}_{0.1}$ alloy

Ali Zeaiter ¹, David Chapelle ¹, Fermin Cuevas ², Anne Maynadier ¹, Michel Latroche ²

¹Univ. Bourgogne Franche-Comté, FEMTO-ST Institute, CNRS/UFC/ENSMM/UTBM

Department of Applied Mechanics, 25000 Besançon, France

²Université Paris EST, ICMPE (UMR7182), CNRS, UPEC, F-94320 Thiais, France

E-mail of the corresponding author: david.chapelle@univ-fcomte.fr

Tel: 03 81 66 60 29

Fax: 03 81 66 67 00

Abstract

TiFe is a remarkable hydrogen storage alloy thanks to its reversibility at ambient temperature and pressure, high capacity and low cost. However, activation and sorption kinetics should be improved for practical applications. The effect of mechanical milling on the morphological, structural and hydrogen sorption properties of powdered $\text{TiFe}_{0.9}\text{Mn}_{0.1}$ alloy has been determined. Pristine alloy powder with mean particle and crystal sizes of 45 μm and 30 nm, respectively, was used as a reference. The pristine powder was ball milled for different times up to 5 hours leading to significant changes in microstructural properties already observed after 0.5 hour of milling. For such short milling time, the particle and crystal sizes decrease by a factor of five and three, respectively, with minor formation, if any, of amorphous phases. These microstructural changes promote a reduction of the activation time towards hydrogen absorption by a factor of five and enhance sorption kinetics. Besides, the

Download English Version:

<https://daneshyari.com/en/article/11000806>

Download Persian Version:

<https://daneshyari.com/article/11000806>

[Daneshyari.com](https://daneshyari.com)