

Accepted Manuscript

Nanocomposite Nd-Fe-Ti-B magnets produced by melt spinning and flash annealing

Akihide Hosokawa, Kenta Takagi, Takahiro Kuriwa

PII: S0304-8853(17)30132-4

DOI: <http://dx.doi.org/10.1016/j.jmmm.2017.05.023>

Reference: MAGMA 62724

To appear in: *Journal of Magnetism and Magnetic Materials*

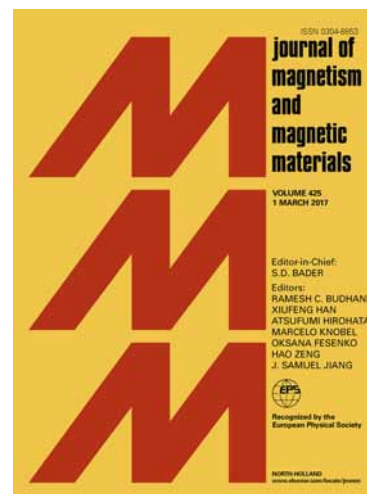
Received Date: 10 February 2017

Revised Date: 20 April 2017

Accepted Date: 7 May 2017

Please cite this article as: A. Hosokawa, K. Takagi, T. Kuriwa, Nanocomposite Nd-Fe-Ti-B magnets produced by melt spinning and flash annealing, *Journal of Magnetism and Magnetic Materials* (2017), doi: <http://dx.doi.org/10.1016/j.jmmm.2017.05.023>

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.



Nanocomposite Nd-Fe-Ti-B magnets produced by melt spinning and flash annealing

Akihide Hosokawa*, Kenta Takagi*, Takahiro Kuriwa**.

* National Institute of Advanced Industrial Science and Technology (AIST), Magnetic Powder Metallurgy Research Center (MagMET), 2268-98 Anagahora Shimoshidami Moriyama-ku Nagoya Aichi 463-8560 Japan

** Santoku Corporation Inc., 1-28 Minamifutami Futami-cho, Akashi, Hyogo 658-0013 Japan

Abstract:

We have attempted to fabricate a nanocomposite Nd-Fe-Ti-B magnet. Flash-lamp rapid annealing treatments were performed for melt-spun ribbons to obtain the α -Fe/Nd₂Fe₁₄B composite microstructure, and the evolution of magnetic properties by the annealing was studied by vibration sample magnetometer (VSM). It was found that the magnetic properties were improved by relatively short-time annealing at the temperatures near the crystallization temperature. Further higher-temperature and longer annealing treatments resulted in deterioration of the magnetic properties. For the selected samples, recoil curves were measured to analyze the spring-back behaviors. Transmission electron microscopy (TEM) was performed to investigate the microstructural factors for the deterioration of the magnetic properties. The relation between the variation of the magnetic properties (coercivity, saturation magnetization and recoil permeability) and the microstructural factors were discussed.

Keywords:

Nanocomposite magnet, exchange coupling magnet, recoil permeability, TEM, spring back.

1. Introduction

A nanocomposite magnet (also referred to as an exchange spring magnet) that consist of soft magnetic phase (e.g. α -Fe, FeCo, and so on) and hard magnetic phase (e.g. Nd₂Fe₁₄B = Nd₁₂Fe₈₂B₆) is a promising candidate for a next generation permanent

Download English Version:

<https://daneshyari.com/en/article/5490836>

Download Persian Version:

<https://daneshyari.com/article/5490836>

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