Accepted Manuscript

Formation of soft magnetic high entropy amorphous alloys composites containing *in situ* solid solution phase

Ran Wei, Huan Sun, Chen Chen, Juan Tao, Fushan Li

PII: S0304-8853(17)31850-4

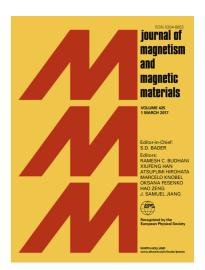
DOI: https://doi.org/10.1016/j.jmmm.2017.09.065

Reference: MAGMA 63195

To appear in: Journal of Magnetism and Magnetic Materials

Received Date: 15 June 2017 Revised Date: 23 September 2017

Accepted Date: 24 September 2017



Please cite this article as: R. Wei, H. Sun, C. Chen, J. Tao, F. Li, Formation of soft magnetic high entropy amorphous alloys composites containing *in situ* solid solution phase, *Journal of Magnetism and Magnetic Materials* (2017), doi: https://doi.org/10.1016/j.jmmm.2017.09.065

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.

ACCEPTED MANUSCRIPT

Formation of soft magnetic high entropy amorphous alloys composites containing *in situ* solid solution phase

Ran Wei, Huan Sun, Chen Chen, Juan Tao, Fushan Li *

School of Materials Science and Engineering, Zhengzhou University, Zhengzhou 450001, China

Corresponding author. E-mail address: fsli@zzu.edu.cn (Fushan Li)

Abstract Fe-Co-Ni-Si-B high entropy amorphous alloys composites (HEAACs), which containing high entropy solid solution phase in amorphous matrix, show good soft magnetic properties and bending ductility even in optimal annealed state, were successfully developed by melt spinning method. The crystallization phase of the HEAACs is solid solution phase with body centered cubic (BCC) structure instead of brittle intermetallic phase. In addition, the BCC phase can transformed into face centered cubic (FCC) phase with temperature rise. Accordingly, Fe-Co-Ni-Si-B high entropy alloys (HEAs) with FCC structure and a small amount of BCC phase was prepared by copper mold casting method. The HEAs exhibit high yield strength (about 1200MPa) and good plastic strain (about 18%). Meanwhile, soft magnetic characteristics of the HEAs are largely reserved from HEAACs. This work provides a new strategy to overcome the annealing induced brittleness of amorphous alloys and design new advanced materials with excellent comprehensive properties.

Keywords: High entropy alloys; Amorphous metals; Magnetic property; Phase transformation, Mechanical properties

1. Introduction

Download English Version:

https://daneshyari.com/en/article/5489948

Download Persian Version:

https://daneshyari.com/article/5489948

<u>Daneshyari.com</u>