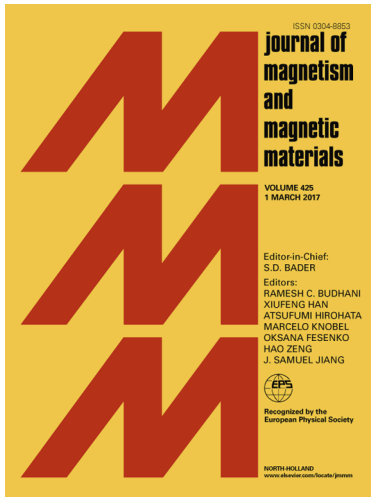

Research articles

Effects of Mg nanopowders intergranular addition on the magnetic properties and corrosion resistance of sintered Nd-Fe-B

Zhi-jie Li, Xiao-er Wang, Jia-yang Li, Jia Li, Hong-zhi Wang

PII: S0304-8853(17)30990-3
DOI: http://dx.doi.org/10.1016/j.jmmm.2017.06.029
Reference: MAGMA 62825

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

Received Date: 26 March 2017
Revised Date: 19 May 2017
Accepted Date: 4 June 2017

Please cite this article as: Z-j. Li, X-e. Wang, J-y. Li, J. Li, H-z. Wang, Effects of Mg nanopowders intergranular addition on the magnetic properties and corrosion resistance of sintered Nd-Fe-B, *Journal of Magnetism and Magnetic Materials* (2017), doi: http://dx.doi.org/10.1016/j.jmmm.2017.06.029

Effects of Mg nanopowders intergranular addition on the magnetic properties and corrosion resistance of sintered Nd-Fe-B

Zhi-jie Li*, Xiao-er Wang, Jia-yang Li，Jia Li，Hong-zhi Wang

School of Science, Shenyang University of Technology, Shenyang 110870, China

ABSTRACT

In order to improve the magnetic properties and corrosion resistance of sintered Nd-Fe-B magnets, the $(PrNd)_{29.9}Dy_{0.1}B_1Co_1Cu_{0.15}Fe_{bal}$ (wt.%) powders were mixed with Mg nanopowders, as grain boundary modifiers. For Nd-Fe-B magnets with 0.1-0.4 wt% Mg addition, the result showed that addition amount of 0.1wt% Mg, H_{cj} reaches the maximum value of 999.1kA/m, Br reaches 1.436T, $(BH)_{max}$ reaches 396.9 kJ/m^3 and magnet density is 7.42 g/cm^3, which are related to the microstructural modification of grain boundaries and the magnet density. Effects of Mg addition on corrosion behavior in sulphuric acid and sodium chloride solution were researched by electrochemical workstation. With increase of Mg addition level, the magnet turns to have a higher corrosion potential and lower corrosion current density, the corrosion poverty is improved. However, temperature coefficient remained nearly unchanged with Mg addition.

Keywords: Sintered Nd-Fe-B; Mg nanopowders; Magnetic properties; Corrosion resistance; temperature coefficient

---

*Corresponding author: Zhijie Li，Tel: +86 24 25497102

E-mail address: zjli1963@126.com