

## Accepted Manuscript

Title: Electrophoretic deposition of graphene oxide as a corrosion inhibitor for sintered NdFeB

Author: Wenting He Liqun Zhu Haining Chen Haiyang Nan  
Weiping Li Huicong Liu Yan Wang



PII: S0169-4332(13)00849-0  
DOI: <http://dx.doi.org/doi:10.1016/j.apsusc.2013.04.130>  
Reference: APSUSC 25599

To appear in: *APSUSC*

Received date: 24-3-2013  
Revised date: 24-4-2013  
Accepted date: 24-4-2013

Please cite this article as: W. He, L. Zhu, H. Chen, H. Nan, W. Li, H. Liu, Y. Wang, Electrophoretic deposition of graphene oxide as a corrosion inhibitor for sintered NdFeB, *Applied Surface Science* (2013), <http://dx.doi.org/10.1016/j.apsusc.2013.04.130>

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.

Electrophoretic deposition of graphene oxide as a corrosion inhibitor for sintered NdFeB

Wenting He<sup>a</sup>, Liqun Zhu<sup>a</sup>, Haining Chen<sup>a</sup>, Haiyang Nan<sup>a</sup>, Weiping Li<sup>a</sup>, Huicong Liu<sup>a\*</sup>, Yan Wang<sup>b</sup>

<sup>a</sup>*Key Laboratory of Aerospace Materials and Performance (Ministry of Education), School of Materials Science and Engineering, Beihang University, Beijing 100191, China*

<sup>b</sup>*School of Materials Science and Engineering, Beihang University, Beijing 100191, China*

Abstract: Graphene oxide (GO) was deposited uniformly on the surface of permanent magnet material NdFeB by electrophoretic deposition (EPD). Electrophoretic deposited graphene oxide (EPD-GO) coating was reduced partially after EPD process, owing to the removal of oxygen functional groups. And EPD-GO coating **showed** excellent adhesion to the NdFeB matrix. According to the results of electrochemical tests, the decrease in **corrosion current density** and the positive shift in **corrosion potential** have both demonstrated that **EPD-GO** coating served as a corrosion inhibitor, protecting **NdFeB** from NaCl aqueous solution.

Keywords: graphene oxide; electrophoretic deposition; NdFeB; corrosion inhibitor

## 1. Introduction

Sintered NdFeB has been widely used due to **its** excellent magnetic properties [1]. However, the low corrosion resistance of NdFeB in common ambient environments due to the porous and multiphase microstructure limits its applications [2-4]. To reduce the corrosion of NdFeB, a number of protective treatments have been investigated, such as alloy addition and surface coating [5,6]. Coatings, namely electroplated Ni, Zn, and Ni-Cu-Ni are generally applied owing to their good anti-corrosion performance and low processing cost. Nevertheless, electroplating is often accompanied by environmental **problems** [7]. Therefore, environmentally friendly methods **for** protecting NdFeB from corrosion have always been a hot research.

\* Corresponding author. Tel. +86 1082317113. Fax: +86 1082317133. E mail address: liuhc@buaa.edu.cn.

Download English Version:

<https://daneshyari.com/en/article/5354306>

Download Persian Version:

<https://daneshyari.com/article/5354306>

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