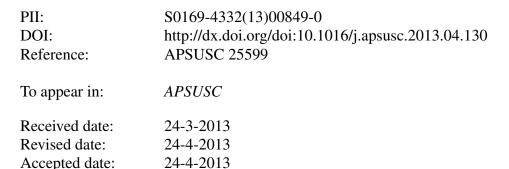
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ACCEPTED MANUSCRIPT

Electrophoretic deposition of graphene oxide as a corrosion inhibitor for sintered NdFeB Wenting He^a, Liqun Zhu^a, Haining Chen^a, Haiyang Nan^a, Weiping Li^a, Huicong Liu^{a*}, Yan Wang^b ^aKey Laboratory of Aerospace Materials and Performance (Ministry of Education), School of Materials Science and Engineering, Beihang University, Beijing 100191, China

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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.

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