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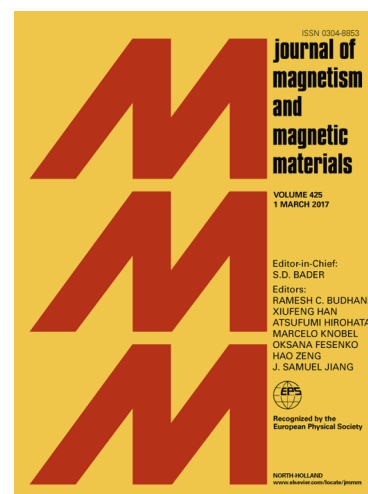
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Effects of Mg nanopowders intergranular addition on the magnetic properties and corrosion resistance of sintered Nd-Fe-B

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ABSTRACT

In order to improve the magnetic properties and corrosion resistance of sintered Nd-Fe-B magnets, the $(\text{PrNd})_{29.9}\text{Dy}_{0.1}\text{B}_1\text{Co}_1\text{Cu}_{0.15}\text{Fe}_{\text{bal}}$ (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 0.1 wt% Mg, H_{cj} reaches the maximum value of 999.1 kA/m, B_{r} reaches 1.436 T, $(BH)_{\text{max}}$ reaches 396.9 kJ/m³ and magnet density is 7.42 g/cm³, 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

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