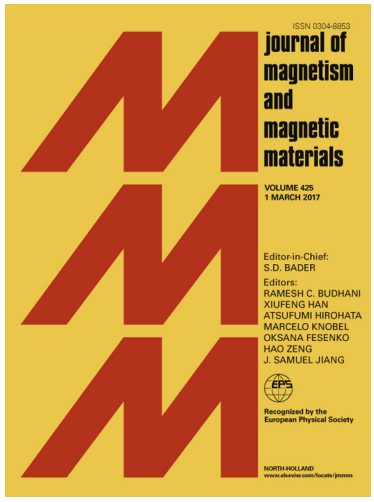

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ABSTRACT

The effects of Zr-substitution on the microstructure and magnetic properties of $[(PrNd)_{0.32}La_{0.22}Ce_{0.46}]_{22.0}Fe_{76.7-x}Zr_xB_{1.3}$ (x=0,2.5,5,7.5 wt%) melt-spun powders have been investigated. It is shown that the Zr addition can prevent the formation of $CeFe_2$ phase and α-Fe phase, increasing the volume fraction of 2:14:1 phase. Furthermore, the Zr addition can refine the grain sizes of α-Fe and 2:14:1 phases. Meanwhile, the formation of Fe_2Zr phase and the decrease of $CeFe_2$ phase improve its antioxidation. And the magnetic properties of bonded magnets are found to increase significantly. The coercivity H_{cj} increases from 2.57 kOe for the Zr-free sample to 5.86 kOe for the Zr-doped sample. The maximum energy product $(BH)_{max}$ of bonded magnets increases from 3.13 MGOe to 6.19 MGOe correspondingly, which attribute to the fine microstructure.

Keywords: microstructure; composition; magnetic properties; Zr addition