Short Communication

Improvement of the Magnetic Properties and Corrosion Resistance of Ga-doped MnBi Alloys

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MnBi_{1-x}Ga_x (x = 0 ~ 0.5) alloys have been fabricated by melt spinning with substantial heat treatment. The effect of Ga content on the microstructure and magnetic properties of these alloys are systemically investigated. The optimal magnetic properties ((BH)_{max}: 0.67 MGOe) are obtained for the Ga-doped (x = 0.1) in terms of the combined effect of coercivity H_{cj} and remanence M_r . Compared to the Ga-free alloy, the remanence and maximum energy product of the Ga-doped (x = 0.1) increase slightly. When x > 0.1, the M_r and (BH)_{max} of the alloys decrease gradually, which is mainly due to the content of LTP-MnBi is decreasing with the increase of Ga content. Besides, a remarkably improvement in electrochemical stability and corrosion resistance for the Ga-doped MnBi alloys by due to the smaller grain size and uniform distribution of magnetic phases. However, the Curie temperature and the phase transition temperature of MnBi alloy decreases with the increase of Ga content.

Keywords: MnBi; Corrosion; Magnetic properties; Microstructure

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