Optimization of the hard magnetic properties of MnBi alloy by minor Pd substitution

P. Gębara,[1] M. Kołodziej,[2,3] and Z. Śniadecki[2]

[1] *Institute of Physics, Częstochowa University of Technology, Armii Krajowej 19 Av., 42-200 Częstochowa, Poland*

[2] *Institute of Molecular Physics, Polish Academy of Sciences, M. Smoluchowskiego 17, 60-179 Poznań, Poland*

[3] *NanoBioMedical Centre of Adam Mickiewicz University, Wszechnicy Piastowskiej 3, 61-614 Poznań, Poland*

MnBi alloys are of the highest importance nowadays due to the significant uniaxial magnetic anisotropy of its low-temperature phase (LTP), which crystallizes in a hexagonal NiAs-type structure. At above 600 K this ferromagnetic phase transforms into a paramagnetic high-temperature phase with a Ni_2In-type structure. Parent MnBi compound and Pd-substituted ($Mn_{50}Bi_{49}Pd$ and $Mn_{49}Bi_{50}Pd$) alloys were synthesized by melt spinning and further heat treatment. Minor addition of Pd stabilizes LTP when compared to parent MnBi compound. It is reflected in considerable increase of coercivity. Optimization of microstructure and domain structure should result in further improvement of hard magnetic properties.