Microstructure and Magnetic Properties of Nd-Fe-B alloys with Addition of Ti and Re

M. Hasiak\textsuperscript{1} and J. Kaleta\textsuperscript{1}

\textsuperscript{1}Wroclaw University of Technology, Smoluchowskiego 25, 50-370 Wroclaw, Poland

Nanocomposite Nd-Fe-B magnetic materials are very interesting because of their good hard magnetic properties i.e. high coercivity, high remanence and energy product. In this paper, we present the role of Ti and Re additions on microstructure and magnetic properties of Nd\textsubscript{8}Fe\textsubscript{80}B\textsubscript{12}, Nd\textsubscript{8}Fe\textsubscript{76}B\textsubscript{12}Ti\textsubscript{4} and Nd\textsubscript{8}Fe\textsubscript{76}B\textsubscript{12}Re\textsubscript{4} alloys. Moreover, the mechanical and chemical properties i.e. microhardness and corrosion resistance were also studied. The investigated alloys were produced by a rapid quenching method in a form of thin ribbons of about 0.025 mm thick. The microstructure was studied at room temperature by X-ray diffraction and Mossbauer spectroscopy in transmission geometry. The magnetic properties were recorded in the temperature range 2-800 K. The obtained results will be discussed from the point of view of microstructure and magnetic properties.

\textit{The research was supported by Wroclaw Research Centre EIT + under the project "The Application of Nanotechnology in Advanced Materials" - NanoMat (POIG.01.01.02-02-002/08) financed by the European Regional Development Fund (Innovative Economy Operational Programme, 1.1.2).}