Physical processing of rapidly quenched alloys – the case of nanocrystalline Fe-B

Peter Svec, Ivan Skorvanek, Dusan Janickovic, Peter Svec Sr.,

Institute of Physics, Slovak Academy of Sciences, Bratislava, Slovakia
Institute of Experimental Physics, Slovak Academy of Sciences, Kosice, Slovakia

Amorphous metastable state of rapidly quenched systems can be used to advantage in tailoring of their physical properties by suitable post-preparation treatment. Among the classical ones are different regimes of thermal treatment and their combinations. Additional dimension and a readily available variable to be considered in the processing is provided by the possibility to complement thermal treatments with simultaneous application of suitable electromagnetic field.

Systems based on Fe-B with additions of small amounts of Cu will be presented with respect to their formation by rapid quenching and to the evolution of structure and properties, especially magnetic properties, under the influence of crystallization in diverse electromagnetic fields.

Knowledge-based optimization of the thermoelectromagnetic processing regime designed for tailoring of structural and magnetic properties will be presented and discussed.