

# INFLUENCE OF WEAK EXTERNAL MAGNETIC FIELD ON AMORPHOUS AND NANOCRYSTALLINE Fe-BASED ALLOYS

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NANOPERM, HITPERM and FINEMET amorphous and nanocrystalline alloys were measured by Mössbauer spectrometry in the weak magnetic field of 0.5 T. It was shown that the most sensitive parameters of Mössbauer spectra are the intensities of 2<sup>nd</sup> and 5<sup>th</sup> lines. Rather small changes were observed also in the case of internal magnetic field values.

The spectrum of nanocrystalline NANOPERM showed the increase of  $A_{23}$  parameter (ratio of line intensities) from 2.4 to 3.7 and decrease of internal magnetic field from 20 to 19 T for amorphous subspectrum under the influence of magnetic field. Spectrum of nanocrystalline FINEMET shown decrease of  $A_{23}$  from 3.5 to 2.6 almost without change of internal magnetic field value. In the case of amorphous NANOPERM and FINEMET samples the changes are almost negligible.

HITPERM alloy shown the highest sensitivity to the weak magnetic field, when  $A_{23}$  increased from 0.4 to 2.5 in the external magnetic fields. The  $A_{23}$  of crystalline subspectrum increased from 2.7 to 3.8 and the value of internal magnetic field corresponding to amorphous subspectrum increased from 22 to 24 T.

The behavior of nanocrystalline alloys under weak external magnetic field was analyzed within three-level relaxation model of magnetic dynamics in an assembly of single-domain particles [1].

[1] M. A. Chuev: J. Phys. Cond. Mat. 20 (2008) 505201

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