

MAGNETIC HYPERFINE FIELDS OF NANOPERM ALLOYS

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This contribution aims in characterization of magnetic hyperfine fields of Fe₉₀Zr₇B₃ NANOPERM nanocrystalline alloys by local probing techniques such as ⁵⁷Fe NMR and ⁵⁷Fe Mössbauer spectrometry as well as by MFM. ⁵⁷Fe NMR enables to distinguish a broad signal of iron located in a residual amorphous matrix and a narrow one which belongs to Fe in nanograins of the NANOPERM nanocrystalline alloy. The former coincides with the distribution of hyperfine fields obtained from ⁵⁷Fe Mössbauer spectroscopy. Optimization of the RF power allows discriminating the observed NMR signal of the Fe nanograins located in magnetic domains from that of the nanograins positioned in domain walls. Employing MFM, the appearance of maze-domains where the magnetization is oriented perpendicular to the ribbon plane is observed. Correlating the obtained images with the results of CEMS they are related to the overcoming of demagnetizing effects in these regions by the magnetoelastic energy due to internal stresses introduced during crystallization.

Presentation preference: Oral

Abstract Category: 5. or 6.

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This work was supported by the grants MSM6198959218, 1M6198959201, VEGA 1/0033/10, P204/10/0035, AV0Z40320502, and SK-PL-0013-09.

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