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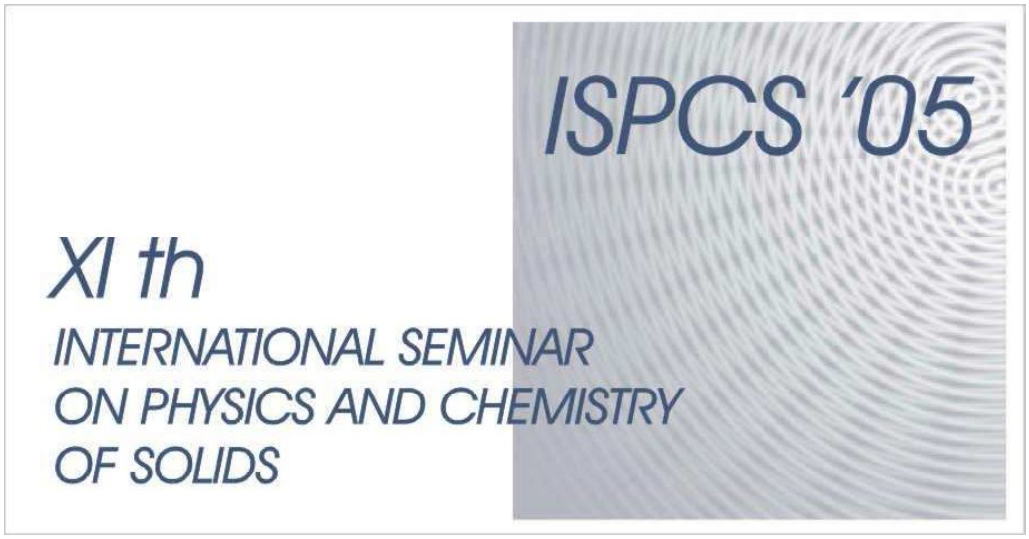

ZŁOTY POTOK k/CZĘSTOCHOWY

29 MAJA – 1 CZERWCA 2005

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Influence of temperature on structure formation of Gd_2Fe_{17} amorphous films

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The influence of temperature on structure Gd_2Fe_{17} films are carried out. A films were prepared with the help of a thermal evaporation at different temperatures of NaCl-substrate carriers and then were exposed by thermal action in a column of the microscope. The temperature of substrate carriers changed within 300-400K range, and limits of thermal effect on films make 300-800K. Structural studies were carried out with using of the electron microscope.

Electron diffraction investigation of the films precipitated at T_s=300K have shown, that these condensates are amorphous. It is noted, that at heating of such films the initial phase at crystallization are *a-Fe* crystallites sizes increase at with temperature. It is confirmed by of a half-width of the diffraction peaks in electron diffraction patterns reduce and it is also indicated in estimation of the sizes of crystallites electron-microscopic images. At further increase of temperature (up 100K higher then temperature of an initial *a-Fe* crystallization) the crystallization of Gd enriched amorphous matrix starts and as result Gd_6Fe_{23} crystallites are formed (structural type Gd_6Fe_{23}, space group Fm-3m). Crystallization of amorphous Gd_2Fe_{17} films completed by forming of polycrystalline film *a-Fe* and Gd_6Fe_{23}.

Significative the different pattern is observed in phase formation kinetic in mode of deposition of films of Gd_2Fe_{17} alloy, obtained at heated substratecarriers. In T_s=400 K range t are observed amorphous films. At T_s=500K there films become as amorphous-crystalline. At the further increase of temperature of substrate carrier the fraction of a polycrystal phase increases. The interpretation of electron diffraction patterns has shown, that the polycrystalline films will consists three phases: Gd_2Fe_{17} (60 %) structural type Th_2Ni_{17} (φ_1-phase), Gd_2Fe_{17} (30 %) structural type Th_2Zn_{17} (φ_2-phase) and in a little (about. 10 %) $GdFe_5$ structural type $CaCu_5$.