XXth
ISPCS
LVIV 2015

The XXth International Seminar on Physics and Chemistry of Solids

PROGRAM AND BOOK OF ABSTRACTS

Lviv, Ukraine, 12 – 15 September 2015

MAGNETIC PROPERTIES OF Gd-Fe SYSTEM

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Investigation of magnetic properties of films of $GdFe_2$, $GdFe_5$ and Gd_2Fe_{17} compounds are complete. Films have been gained by a method of thermal evaporation on teflon substrates at room temperatures.

The hysteresis curves for volume and thin-film samples specify in that fact that these materials belong to the class of magneto-soft compounds. It is necessary to score also the significant differences in character of hysteresis loops for volume and thin-film samples of all compounds of this system. Absolute values of a coercive force for amorphous and polycrystalline films, and volume compounds was determinate. Value of a coercive force decreases at formation of amorphous films in comparison with volume samples in 2 times. Formation of a polycrystalline phase in films give rise to increasing coercive force in 1.5 times in comparison with volume samples (polycrystalline films become more magneto-hard). For absolute value of a coercive force does not matter how there is a crystallisation, or in the process of film formation on the warmed-up substrate, or in the process of annealing of amorphous films after their deposition.

Values of Curie temperature, curves of specific magnetisation, and hysteresis curves for massive and thin-film samples are determined. It is spotted that the Curie temperature of massive samples corresponds to references. At examination of thin-film samples Curie temperature reduction was observed. Such depression of Curie temperature speaks expansion of a crystalline lattice owing to formation of microdefect (films were is amorphous-crystal).

Temperature dependences of magnetic saturation for compounds and films of Gd-Fe system are determined. The given dependences characteristic for materials of such class. Magnetic saturation of films Gd_2Fe_{17} and $GdFe_2$ at room temperature are measured.

STRUCTURAL PARAMETERS AND SUPERCONDUCTIVITY OF THE LAVES PHASE $ZrNi_xAl_{2-x}$

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Multicomponent alloys containing aluminum, 3*d* transition metals and refractory metals like V, Hf, and Zr are of the great interest because of their unique physical properties. In a non-crystalline form they demonstrate high strength, plasticity and corrosion resistance. Isothermal section of the Al-Ni-Zr phase diagram at 1073 K in a full concentration range [1] and partial cross sections at 1273 and 1473 K in Ni-rich area have