9.7 cm

MAGNETOELASTIC PHASE TRANSITIONS IN $\mathbf{MnFe_{1-x}Co_xAs}$ SYSTEM

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The $MnFe_{1-x}Co_xAs$ system of solid solutions exhibits three types of crystal structure: tetragonal structure of Fe_2As type, hexagonal one of Fe_2P type and orthorhombic one of Co_2P type for low, intermediate and high cobalt content, respectively. In this report results of dc magnetic field magnetization measurements (1,5K-300K), ac susceptibility measurements under pressure (up to 1.5 GPa) and X-ray diffraction experiments (80K-300K) are presented. They were carried out for three samples with x=0.50, x=0.80 and x=0.85. In the case $MnFe_{0.5}Co_{0.5}As$ magnetic field induced first order phase transition was discovered. We found that the hysteresis distance slightly changes with temperature. Moreover the critical field decreases vs. temperature and vanishes to zero at the vicinity of the Neel temperature. – AC susceptibility measurements under pressure allowed to determine pressure dependence of the Curie temperature TC. In the case of x=0.85 TC strongly increases vs. pressure with the slope equal to +26 K/GPa. On the other hand X-ray diffraction spectra for three studied contents were recorded at different temperatures. The lattice parameters and the unit cell volume jump both at the metamagnetic (AF-Ferro) and at the Curie temperature was found. To summarize the results the (B,T) and (P,T) magnetic phase diagrams are also presented.

13.4 cm

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