9.7 cm

MAGNETOELASTIC PHASE TRANSITIONS AND CRITICAL BEHAVIOUR OF $(Fe_{1-x}Ni_x)_2P$ SYSTEM

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Magnetic properties of $(\mathrm{Fe_{1-x}Ni_x})_2\mathrm{P}$ system were reported previously in several papers . This report focuses on critical behaviour of samples with low Ni content (x=0.01, 0.015) in weak magnetic field. In (B, T) magnetic phase diagrams an isolated critical point, rather rare phenomenon in solid state, was established. The semiquantitative analysis of (B, T) phase diagrams was carried out in the frame of molecular field approximation. (P, T) phase diagrams are also reported for several Ni contents. Moreover, temperature variation of the lattice parameter, measured by means of X-rays diffraction technique, is also presented. Finally, Mössbauer spectra were collected in transmission geometry at various temperatures below and above Curie temperature for samples of x=0.025, 0.1, 0.2, 0.25. All the Mössbauer spectra show the existence of two sites of iron atoms, the first one in tetragonal site, the second one in pyramidal site. Basing both on the Mössbauer spectra and on the interatomic distances obtained from X-rays data the magnetic interactions in the considered system are analysed.

13.4 cm

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