

Mössbauer spectroscopy investigation of $\text{YFe}_x\text{Co}_{2-x}$ ($x = 0.03$ and 1) compounds

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YCo_2 compound is an exchange-enhanced Pauli paramagnet on the verge of being magnetic. Ferromagnetic long-range ordering can be induced by topological or chemical disorder [1]. The influence of Fe substitution and quenched-in topological disorder on the magnetic properties of $\text{YFe}_{0.03}\text{Co}_{1.97}$ and YFeCo is studied by means of x-ray diffraction, vibrating sample magnetometry, Mössbauer spectroscopy and AC magnetic susceptibility measurements. All samples crystallize in cubic MgCu_2 -type phase with lattice constant changing from 7.223 Å for YCo_2 to 7.313 Å for YFeCo . Fe atoms are responsible for stabilization of magnetic moments on Co and mictomagnetism is observed in $\text{YFe}_{0.03}\text{Co}_{1.97}$ sample. The Mössbauer spectra permitted distinction between two magnetically inequivalent Fe sites, as reported earlier for YFe_2 [2].

References:

[1] Z. Śniadecki et al., J. Appl. Phys. 115 (2014) 17E129

[2] Y. Nishihara et al., J. Phys. Soc. Jpn. 51 (1982) 2487-2492