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Mössbauer study of a collinear spin density wave phase in $Fe_{1.125}Te$

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The recent discovery of iron-based superconductors [1, 2] has stimulated great interest to studies of iron chalcogenides. Close connection between magnetic and superconducting properties in the iron-based superconductors does not allow to investigate these phenomena separately. The recent neutron diffraction studies of a number of Fe(1+y)Te samples have shown that the presence of non-stoichiometric iron (y) complicates magnetic ordering in these systems [3]. It was shown that the Fe(1+y)Te phase diagram consists of two distinct areas corresponding to collinear and helical magnetic ordering at low and large concentrations of the excess iron, respectively [3]. The transition point between these two areas corresponds to a concentration of excess iron of about 0.125, and it was shown that the magnetic ordering of the system corresponds to a collinear spin density wave phase.

In the present study, the low-temperature Mössbauer spectroscopy measurements have been carried out to investigate peculiarities of the collinear spin density wave phase in Fe1.125Te. Mössbauer spectra were collected in a temperature range from liquid helium up to room temperature. The low temperature spectra of Fe1.125Te have shown a complex shape somewhat similar to that reported for Fe1.05Te [4]. It was approximated with a set of magnetic sextets with a distribution of hyperfine fields. The obtained distribution appeared to be in a good agreement with the recent neutron diffraction studies reported in Ref. [3].

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REFERENCES

1. Mizuguchi, Y. FeTe as a candidate material for new iron-based superconductor /Y. Mizuguchi, et al. // Physica C: Superconductivity. –2009. – V. 469,N15. – P. 1027–1029.
2. Kamihara, Y. Iron-based layered superconductor La[O1-xFx]FeAs (x = 0.05–0.12) with Tc = 26K / Y. Kamihara, et al. // J. Am. Chem. Soc. – 2008. –V. 130,N11. – P. 3296–3297.
3. Stock C. Competing spin density wave, collinear, and helical magnetism in Fe1+xTe / C. Stock, E. E. Rodriguez, et al. // Physical Review B. – 2017. – V. 95,N14. – P. 144407.
4. Kiiamov A.G. Mössbauer spectroscopy evidence of intrinsic non-stoichiometry in iron telluride single crystals / A. G. Kiiamov, Y. V. Lysogorskiy, F. G. Vagizov, et al. // Annalen der Physik. – 2017. – V. 529,N4. – P. 1600241