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EFFECT OF THE YB/MN RATIO ON THE ESR SPECTRUM OF YBMNO3

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Polycrystalline samples of ytterbium manganites $YbMnO_3$ were synthesized according to two different ceramic technologies ($YbMnO_3$-I and $YbMnO_3$-II). These technologies differ in the sintering time and annealing temperature. The X-ray analysis of the synthesized manganites (I and II) showed that both samples belong to the space group $P6_3cm$ and they are in single-phase state. The analysis of the XRD peak intensities demonstrated only the slight deviation in oxygen content and Yb/Mn ration between two samples. Electron spin resonance (ESR) was much more sensitive to such at first glance small differences in the crystal structure.

ESR measurements were carried out in the temperature range of 100 - 320K at the frequency of 9.48GHz. The ESR spectrum of ytterbium manganite $YbMnO_3$ (I and II) consists of one broad exchange-narrowed resonance line in all temperature range for both samples.

At the same time the fitting of the ESR spectrum of YbMnO3-I gives the g-factor above 2.1, which is unusual for Mn^{3+} ions, and 1.99 for $YbMnO_3$-II. The ESR linewidth is about 800 Oe in both cases, that is 2.3

times less that in $La_{0.95}Sr_{0.05}MnO_3$ or in $GdMnO_3$, where the linewidth of the ESR line at room temperature is several thousand oersted, and the effective g-factor is less than 2 [1, 2]. Moreover, in W-band (94 GHz) the ESR spectrum of $YbMnO_3$-I splits in two lines, when the ESR spectrum of $YbMnO_3$-II still consists of one exchange-narrowed resonance line. The possible reasons of the phenomenon are under discussion.

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[1]. J. Deisenhofer, M. V. Eremin, D. V. Zakharov, et al. Phys. Rev. B 65, 104440 (2002).
[2]. I. V. Yatsyk, D. V. Mamedov, I. I. Fazlizhanov, et. al. JETP Lett. 96, 416 (2012).