

## Magnetic properties of YbMnO<sub>3</sub> ceramic samples

R.M. Eremina<sup>1,2</sup>, I.V. Yatzyk<sup>1,2</sup>, T.P. Gavrilova<sup>1,2</sup>,  
V.V. Parfenov<sup>2</sup>, V.I. Chichkov<sup>3</sup>, N.V. Andreev<sup>3</sup>

<sup>1</sup>Kazan E. K. Zavoisky Physical-Technical Institute of the RAS, Kazan, 420029, Russia,  
REremina@yandex.ru

<sup>2</sup>Kazan (Volga Region) Federal University, Kazan, 420008, Russia

<sup>3</sup>National University of Science and Technology MISiS, Moscow, 119991, Russia

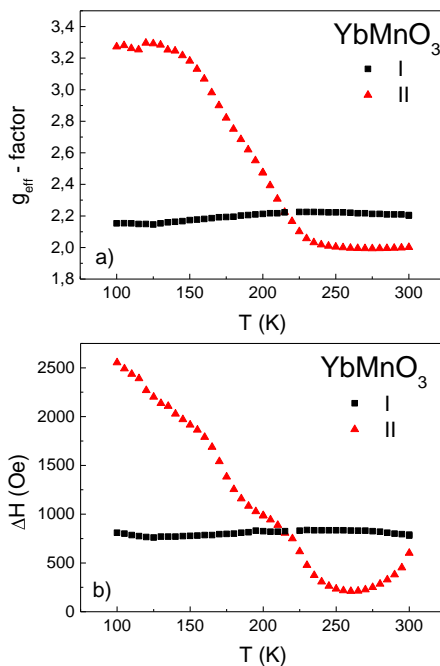


Fig. 1. Temperature dependence of g-factor (a) and ESR linewidth (b) in YbMnO<sub>3</sub>

Polycrystalline samples of ytterbium manganites YbMnO<sub>3</sub> were synthesized according to two different ceramic technologies (YbMnO<sub>3</sub>-I and YbMnO<sub>3</sub>-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<sub>3</sub>cm and they are in single-phase state. The analysis of the XRD peak intensities demonstrated the difference in the atom site occupancy for Yb ions between two samples. Electron spin resonance (ESR) was much more sensitive to such 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<sub>3</sub> (I and II) consists of one broad exchange-narrowed resonance line in all temperature range for both samples. The fitting of the ESR spectrum of YbMnO<sub>3</sub>-I gives the g-factor above 2.1 (Fig. 1a), which is unusual for Mn<sup>3+</sup> ions. The g-factor of YbMnO<sub>3</sub>-II changes from 1.99 to 3.3 (Fig. 1b), that corresponds to middle g-factors of Mn<sup>3+</sup> and Yb<sup>3+</sup> ions systems, respectively. This temperature dependencies g-value and linewidth suggests the strong exchange interaction between Mn<sup>3+</sup> and Yb<sup>3+</sup> ions. The ESR linewidth is about 800 Oe in room temperature in both cases. The possible reasons of the phenomenon are under discussion.