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Magnetic properties of $Cu_{1.8}Mn_{1.2}BO_5$ crystal

Rushana M. Eremina,[1,2] Ivan V. Yatsyk,[1,2] Evgeniya M. Moshkina,[3] Mikhail V. Rautskii,[3] Leonard N. Bezmaternykh,[3] Hans-Albrecht Krug von Nidda,[4] Alois Liodl[4]

[1]*Kazan E. K. Zavoisky Physical-Technical Institute of the RAS, Sibirsky tract 10/7, Kazan, 420029, Russia*
[2]*Kazan (Volga Region) Federal University, Kremlyovskaya st. 18, 420018, Kazan, Russia*
[3] *L .V. Kirensky Institute of Physics, 660036 Krasnoyarsk, Russia*
[4]*Institut fur Physik, University Augsburg, 86135 Augsburg, Germany*

E-mail: rmv@iph.krasn.ru

$Cu_{1.8}Mn_{1.2}BO_5$ single crystals were synthesized by the flux method with the ratio of the initial components $Bi_2Mo_3O_{12}$: $1.3B_2O_3$: $0.7Na_2CO_3$: $0.7Mn_2O_3$: 2.1CuO. The grown single crystals have the form of orthogonal prisms with a length of 10 mm and a transverse size of about 2 mm. The sample belongs to the space group $P2_{1/c}$. The magnetization measurements showed that the phase transition temperature in $Cu_{1.8}Mn_{1.2}BO_5$ is T~90K. In the 75 K region, a feature in the magnetic susceptibility behavior is observed in both ZFC and FC regimes, which can be related to different temperature dependence of magnetization of different sublattices Mn and Cu. ESR measurements were carried out in the paramagnetic regime at the temperature above the phase transition temperature T~90K at the 9.48GHz (X-band) and 34GHz (Q-band). In this temperature range the ESR spectrum of $Cu_{1.8}Mn_{1.2}BO_5$ consists of one broad exchange-narrowed resonance line. Near the phase transition the ESR linewidth exhibits its minimum value of about 1500 Oe in X- band and 2500 Oe in Q-band (Fig.1). Above the phase transition the linewidth increases monotonically with increasing temperature. In addition, the linewidth shows a pronounced anisotropy which depended from frequency band. The g-factor of the resonance signal are anisotropy and equal along one direction g_1=1.81 and along second direction g_2=1.92.

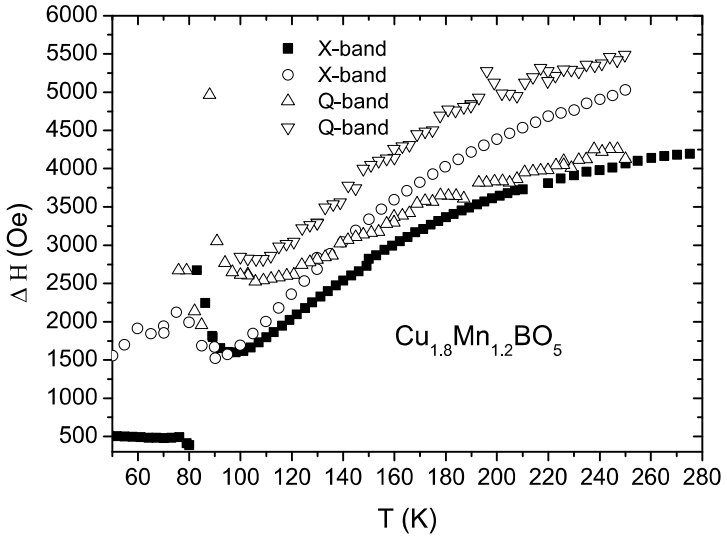

Fig. 1. Temperature dependence of ESR linewidth in X- and Q- band in two directions of magnetic fields.

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