NUCLEAR MAGNETIC RESONANCE OF ^{57}Fe IN BISMUTH-YTTRIUM GARNETS

H. Štěpánková[a], T. Okuda[b], E. Gamaliy[a], A. Snezhko[a], N. Adachi[b], T. Kaneuji[b]

[a]Faculty of Mathematics and Physics, Charles University
180 00 Prague 8, V Holešovičkách 2, Czech Republic
[b]Nagoya Institute of Technology
Gokiso-cho, Showa-ku, Nagoya,466-8555 Japan

9.7 cm

We report ^{57}Fe NMR spectra of a bismuth-yttrium iron garnet system $Bi_xY_{3-x}Fe_5O_{12}$. The spectra were measured using spin echo technique at 4.2 K in zero external magnetic field. We were able to detect the ^{57}Fe NMR signal of a single crystal film of bismuth iron garnet $Bi_3Fe_5O_{12}$ prepared by ion beam sputtering on $Nd_3Ga_5O_{12}$ substrate. The spectrum is in agreement with iron garnet structure having magnetization along [111] direction: one d-line at 66.46 MHz assigned to tetrahedral iron sites a-lines at 74.00 and 75.05 MHz with the intensity ratio 1:3 assigned to octahedral iron sites. The resonant frequencies are slightly shifted in comparison with yttrium iron garnet $Y_3Fe_5O_{12}$. Spectra of partially substituted samples (x=0.16 and 2.75) exhibit satellite structure or broadening corresponding to the distribution of Y and Bi in dodecahedral sites.

13.4 cm

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Corresponding author :
H. Štěpánková

Address for correspondence :
Faculty of Mathematics and Physics
Charles University
180 00 Prague 8
V Holešovičkách 2
Czech Republic

Email address :
stepanko@mbox.troja.mff.cuni.cz