THE EFFECT OF VARIATION OF THE BISMUTH CONTENT ON THE MAGNETIC PROPERTIES OF Y$_{3-x}$Bi$_x$Fe$_5$O$_{12}$ SYSTEM

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ABSTRACT

Y$_{3.0-x}$Bi$_x$Fe$_5$O$_{12}$ samples were prepared via conventional technique. Four samples of Y$_{3.0-x}$Bi$_x$Fe$_5$O$_{12}$ were prepared (x = 0.2, 0.4, 0.6, 0.8). The samples were then studied for general variation of Curie temperature and initial permeability with bismuth content. All the compounds prepared were identified by X-Ray Diffraction. Sample with the highest content of bismuth, sample Y$_{2.2}$Bi$_{0.8}$Fe$_5$O$_{12}$, recorded the highest Curie temperature and the highest initial permeability. The bismuth is speculated to give rise to the strong super-exchange interaction and this results in the increase of Curie temperature. Additionally, the bismuth content works as a sintering aid to assist grain growth during sintering and hence enhances the initial permeability.

REFERENCES