

Structural and magnetic behavior of the LPT MnBi phase

R. Hirian,¹ T.-L. Biter,¹ A. Boiciuc,¹ O. Isnard,^{2,3} and V. Pop¹

¹*Faculty of Physics, Babeş-Bolyai University,
Cluj-Napoca, RO-400084 Romania*

²*University Grenoble Alpes, Institut NÉEL,
25 rue des Martyrs, F-38042 Grenoble, France*

³*CNRS, Institut NÉEL, 25 rue des Martyrs, F-38042 Grenoble, France*

The Low Temperature (LTP) MnBi phase is very attractive as a permanent magnet, due to its large magnetocrystalline anisotropy (K of 107 erg/cm³), relatively high magnetization and most of all due to its positive temperature coefficient of coercivity. The synthesis of the (LTP) MnBi single phase has proven to be a difficult task. In our study the MnBi ingot was prepared by arc melting under a purified Ar atmosphere and annealing at 400 °C for 10 to 72 hours. X-ray diffraction patterns showed that the resulting samples had a high concentration (more than 80%) of LTP MnBi phase. Some traces of Mn and Bi were also visible in XRD. Magnetic measurements at 300 K indicate that the coercivity is highly dependent on the microstructure of the samples, as the coercive field (H_c) increases from 0.03 T (in the bulk samples) to 0.3 T in ground samples.

*Financial support of Romanian Ministry of Education and Research, grant
PN-II-RU-TE-2014-4-2360*