



Contribution ID: 415

Type: **Oral presentation (15min)**

5T class superconducting bulk magnet using MgB₂ bulk doped with Ti

Wednesday, 9 July 2014 11:45 (15 minutes)

MgB₂ superconductors have mainly been studied for the practical application of tapes and thin films owing to its high T_c of about 39 K and a high upper critical field among metallic superconductors. We have studied that the trapped field properties of MgB₂ bulk samples fabricated by the capsule and hot isostatic pressing (HIP) methods and succeeded in producing the 2-3 T class bulk magnet. Recently, a trapped field of 5.4 T was reported for the hot-pressed MgB₂ bulk using the mechanical alloyed precursor powder [1].

In this paper, to obtain the higher trapped field we studied the doping effect of Ti on the trapped field in MgB₂ bulk samples fabricated by the HIP method. The Mg(1-x)Ti_xB₂ bulk samples were magnetized by the field cooling magnetization (FCM) in a magnetic field of 10 T using a 10 T cryogen-free superconducting magnet. The highest trapped field at the top surface of the single bulk (x=0.1) was 3.6 T and that at the center between the doubly stacked bulks (x=0.05 and 0.1) was 4.6 T. We discuss precisely the effect of Ti on the enhancement of the vortex pinning from the analysis of the micro structure.

[1] G. Fuchs et al, Supercond. Sci. Technol. 26 (2013) 122002.

Primary author: Dr NAITO, Tomoyuki (Iwate University)

Co-authors: Prof. FUJISHIRO, Hiroyuki (Iwate University); Mr YOSHIDA, Takafumi (Iwate University)

Presenter: Dr NAITO, Tomoyuki (Iwate University)

Session Classification: Wed-Mo-Orals Session 9

Track Classification: M-04: MgB₂ processing and properties