Contribution ID: **890** Contribution code: **FRI-OR7-502-08** Type: **Oral**

Trapped Field Characteristics of K-doped Ba122 Polycrystalline Bulks Synthesized by Spark Plasma Sintering

Friday, 19 November 2021 11:45 (15 minutes)

BaFe2As2 (Ba122) shows high upper critical field (Hc2 > 50 T) with small electromagnetic anisotropy (γ ~ 1-2) [1] and large critical grain boundary angle (θc ~9°) [2], and therefore is a promising material for applications in polycrystalline form. Foreseeing high field magnet applications, Weiss et al. have reported demonstration of trapped field of 1 T for K-doped Ba122 polycrystalline bulks synthesized by hot isostatic pressing [3]. In this study, we synthesized K-doped Ba122 bulks by combination of high-energy-milling of precursor powder [4, 5] and Spark Plasma Sintering (SPS) [6] and evaluated trapped field characteristics of them. In order to accelerate the optimization of synthesis conditions to obtain high Jc, machine learning technique has been employed [7].

References
[1] A. Yamamoto et al., Appl. Phys. Lett. 94, 062511 (2009).
[2] T. Katase et al., Nat. Commun. 2, 409 (2011).
[3] J. D. Weiss et al., Supercond. Sci. Technol., 28, 112001 (2015).
[4] S. Tokuta and A. Yamamoto, APL Materials 7, 111107 (2019).
[5] S. Tokuta, Y. Shimada, and A. Yamamoto, Supercond. Sci. Technol. 33, 094010 (2020).
[6] S. Tokuta et al., ASC2020, Wk2MPo3B-05 (2020).
[7] A. Yamamoto et al., ASC2020, Wk1MOr3B-02 (2020).

Acknowledgement
This work was supported by JST CREST (JPMJCR18J4), JSPS KAKENHI (JP21H01615), MEXT Elements Strategy Initiative to Form Core Research Center (JPMXP0112101001), and Nanotechnology Platform (A-18-TU-0037) of the MEXT, Japan.

Primary author: Mr TOKUTA, Shinnosuke (Tokyo University of Agriculture and Technology)

Co-authors: Mr HASEGAWA, Yuta (Tokyo University of Agriculture and Technology); Mr OKADA, Yuki (Tokyo University of Agriculture and Technology); Mr ISHII, Akimitsu (Tokyo University of Agriculture and Technology); Dr YAMANAKA, Akinori (Tokyo University of Agriculture and Technology); Dr SHIMADA, Yusuke (Tohoku University); Dr HATA, Satoshi (Kyushu University); Dr YAMAMOTO, Akiyasu (Tokyo University of Agriculture and Technology)

Presenter: Mr TOKUTA, Shinnosuke (Tokyo University of Agriculture and Technology)

Session Classification: FRI-OR7-502 SMES, Superconducting Transformers, Cables and Bulks