

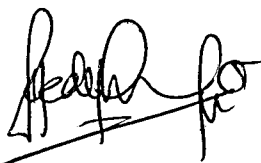
**FABRICATION AND CHARACTERIZATION OF BSCCO POWDER
WITH THE ADDITION OF NANOSIZE ALUMINIUM OXIDE**

SITI FAIRUZ BINTI MOHD NOOR

**Final Year Project Report Submitted in
Partial Fulfilment of the Requirements for the
Degree of Bachelor of Science (Hons.) Physics
in the Faculty of Applied Sciences
Universiti Teknologi MARA**

MAY 2008

This Final Year project Report entitled “**Fabrication and Characterization of BSCCO Powder with The Addition of Nanosize Aluminium Oxide**” was submitted by Siti Fairuz Binti Mohd Noor, in partial fulfillment of the requirements for the Degree of Bachelor of Science (Hons.) Physics, in the Faculty of Applied Sciences, and was approved by



Dr. Syed Yusainee Syed Yahya
Supervisor
B. Sc. (Hons.) Physics
Faculty of Applied Sciences
Universiti Teknologi MARA
40450 Shah Alam
Selangor

Pn. Norazila Ibrahim
Co-Supervisor
B. Sc. (Hons.) Physics
Faculty of Applied Sciences
Universiti Teknologi MARA
40450 Shah Alam
Selangor



En. Md. Yusof Theeran
Final Year Project Coordinator
B. Sc. (Hons.) Physics
Faculty of Applied Sciences
Universiti Teknologi MARA
40450 Shah Alam
Selangor



Dr. Muhd Zu Azhan Yahya
Head of Programme
B. Sc. (Hons.) Physics
Faculty of Applied Sciences
Universiti Teknologi MARA
40450 Shah Alam
Selangor

Date: _____

12/6/08

ACKNOWLEDGEMENT

Alhamdulillah, first and foremost I would like to thank Allah S.W.T because with His help, I finally finish my thesis, PHY690 and has been successfully submitted as planned. Secondly, special thanks to express my sincere gratitude to my supervisor, Dr. Syed Yusainee Bin Syed Yahya for giving me support and knowledge regarding this final project paper, willing to spend time and helping me when I have problems while conducting my project. A million thanks to my co-supervisor, Pn. Norazila Binti Ibrahim for your support and commitment and also to Associate Prof. Dr. Ahmad Kamal Hayati for giving opportunity and permission to use the equipments and facilities in the superconductor laboratory.

I also would like to express my appreciations to all research assistants and master's students who are willing to spend time in helping me to do this project and to make sure my project is completed; great thanks to Cik Masnita, Cik Nur Madihah, En. Mohd Muzammir and Cik Norashikin.

Lastly, to all my friends and to my loving family, thanks so much for all moral support and for continuously pray for my success.

Thank you very much.

Siti Fairuz Binti Mohd Noor
Mei, 2008

ABSTRACT

FABRICATION AND CHARACTERIZATION OF BSCCO POWDER WITH THE ADDITON OF NANOSIZE ALUMINIUM OXIDE

Nanometer Al_2O_3 particles were introduced into BSCCO system to act as flux pinning centers. It has been added to $\text{Bi}_{1.6}$, $\text{Pb}_{0.4}$, Sr_2 , Ca_2 , Cu_3 , O_x (Bi-2223) precursor powders during the final sintering cycle of a multi-step preparation process. The influence of Al_2O_3 on the T_c , J_c and phase formation of ceramics was studied by means of electrical measurement and XRD. This research shows that the addition of a small amount of Al_2O_3 (0.3wt%) increased the pellet's critical current density, J_c at 77K. The result indicate that the introduction of a proper amount of nano- Al_2O_3 particles during the final processing of BSCCO samples can affectively improve the flux pinning ability and has a little detrimental effect on the (Bi-Pb)-2223 formation process. The proportions of Bi-2223/Bi-2212(%) phase in the phase mixture were estimated to be 75.5/24.5 and 91.8/8.2 % respectively for samples with addition 0.0 wt% and 0.3 wt%. The results were compared with bulk sample without nano-particles Al_2O_3 addition.

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