

**THE DURABILITY OF  $\text{HoBa}_2\text{Cu}_3\text{O}_{7-\delta}$  AND  $\text{HoBa}_2\text{Cu}_3\text{O}_{7-\delta}$  (WITH ELEMENTAL  
SUBSTITUTION- Sr AT Ba SITE OF THE CERAMICS WITH THE HOT SPOT  
PHENOMENA)**

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the Degree of Bachelor of Science (Hons.) Physics in the Faculty of Applied  
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This Final Year Project Report entitled “**The Durability of  $\text{HoBa}_2\text{Cu}_3\text{O}_{7-\delta}$  and  $\text{HoBa}_2\text{Cu}_3\text{O}_{7.6}$  (with elemental substitution- Sr at Ba site of the ceramics with the hot spot phenomena)**” was submitted by Mohd Farouk Afizal Ismail, in partial fulfillment of requirement for the Degree of Bachelor of Science (Hons.) Physics, in the Faculty of Applied Science, and was approved by



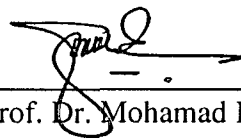
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## ABSTRACT

### THE DURABILITY OF $\text{HoBa}_2\text{Cu}_3\text{O}_{7-\delta}$ AND $\text{HoBa}_2\text{Cu}_3\text{O}_{7-\delta}$ (WITH ELEMENTAL SUBSTITUTION- Sr AT Ba SITE OF THE CERAMICS WITH THE HOT SPOT PHENOMENA)

A hot spot, which is local area glowing orange appear in  $\text{HoBa}_2\text{Cu}_3\text{O}_{7-\delta}$  ceramics the certain voltage is applied to the rod at room temperature. The durability of the rod during a sustained presence of the hot is improved upon substitution of Sr at Ba site. In this experiment, the  $\text{HoBa}_2\text{Cu}_3\text{O}_{7-\delta}$  ceramics were prepared using conventional solid-state reaction. The experiment was done using three different samples;  $\text{HoBa}_2\text{Cu}_3\text{O}_{7-\delta}$  without any substitution,  $\text{HoBa}_2\text{Cu}_3\text{O}_{7-\delta}$  with 0.3 mol% substitution and 0.5 mol% substitution of Sr at Ba site. The samples were cut into rod shape of dimension (0.65 x 0.65 x 12) mm. All the samples were tested for its current-voltage characteristics using the four-point-probe method. The voltages of hot spot appearance were determined. The durability of rod was determined by the time of appearance of hot spot. The results showed different durability for different samples. There are also some differences in power consumptions of the rod due to the Sr substitution content.