

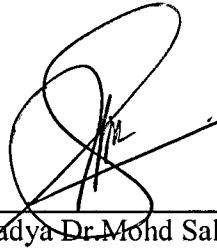
**ELASTIC STUDY OF QUENCH AND COMPOSITE EUROPIUM  
BARIUM COPPER OXIDE ( $\text{EuBa}_2\text{Cu}_3\text{O}_{7-\delta}$  (Eu123))  
SUPERCONDUCTOR**

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**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**

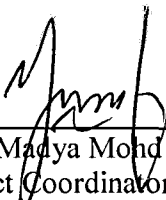
**MAY 2010**

This Final Year Project Report entitled “Elastic Study of Quench and composite Europium Barium Copper Oxide ( $\text{EuBa}_2\text{Cu}_3\text{O}_{7-\delta}(\text{Eu123})$ ) Superconductor” was submitted by Siti Noorzuraidah binti Jusoh, in partial fulfilment of the requirements for the Degree of Bachelor of Science (Hons.) Physics, in the Faculty of Applied Sciences, and was approved by



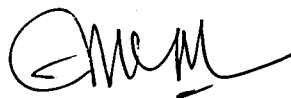
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## ABSTRACT

Ultrasonic longitudinal and shear velocities at 9MHz were measured using pulse-echo overlap techniques in temperature ranges of 80-280K and 80-220K, respectively, in  $\text{EuBa}_2\text{Cu}_3\text{O}_{7-\delta} + y\text{wt.}\% \text{Al}_2\text{O}_3$  ( $y = 0, 0(\text{quenched}), 0.2$  and  $0.4$ ) superconductors. A step-like elastic anomaly indicating sudden lattice stiffening was observed for  $x=0$  at around 260K. However upon quenching to reduce the oxygen content, no anomaly was observed and only a monotonous change in velocity with increasing temperature was observed. Addition of  $\text{Al}_2\text{O}_3$  only shifted the anomaly to slightly lower temperatures. The step-like elastic anomaly was discussed in terms of oxygen ordering involving Cu-O chains.