## THE EFFECT OF PbO-B<sub>2</sub>O<sub>3</sub> GLASS ADDITION TO THE DIELECTRIC PROPERTIES OF CaCu<sub>3</sub>Ti<sub>4</sub>O<sub>12</sub> (CCTO)

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This Final Year Project Report entitled **"The Effect of Pbo-B**<sub>2</sub>**o**<sub>3</sub> **Glass Addition to the Dielectric Properties Of CaCu**<sub>3</sub>**Ti**<sub>4</sub>**O**<sub>12</sub> **(CCTO)**" was submitted by Nur Zarifah Syazwani Bt Noreaini, in partial fulfillment of the requirement for the Degree of Bachelor of Science (Hons.) Physic, in the Faculty of Applied Sciences and was approved by

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#### ABSTRACT

# THE EFFECT OF PbO-B<sub>2</sub>O<sub>3</sub> GLASS ADDITION TO THE DIELECTRIC PROPERTIES OF CaCu<sub>3</sub>Ti<sub>4</sub>O<sub>12</sub> (CCTO)

Pure and PbO-B<sub>2</sub>O<sub>3</sub> -doped glass to CCTO (CaCu<sub>3</sub>Ti<sub>4</sub>O<sub>12</sub>) ceramics were prepared by a conventional solid-state reaction method, and the effects of glass doping on the microstructures and electrical properties of these ceramics were investigated. CCTO has challenged for the last few years the scientific community due to its large dielectric constant, which is almost temperature and frequency independent. This makes the material desirable for many electronic applications. However, the dissipation factor is very large, with tan  $\delta$  values, at room temperature and 1 kHz, higher than 0.1. In our work we report how the addition of glass lowers the dielectric loss and, high dielectric constant values are still can be reached. The sample of doped CCTO with 0.05 of by weight, presents, at room temperature, a large dielectric constant, over 360000, and a dissipation factor around 0.09, which represents a decrease on tan  $\delta$  relatively to the CCTO undoped sample.