

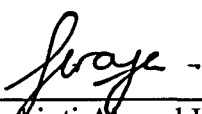
**CHARACTERIZATION OF  $\text{Li}_4\text{Ca}_2\text{O}_4$  AND  $\text{Li}_2\text{MgO}_2$  USING XRD, SEM AND UV  
Vis NiR SPECTROSCOPY**

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

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This Final Year Project Report entitled “Characterization of  $\text{Li}_4\text{Ca}_2\text{O}_4$  and  $\text{Li}_2\text{MgO}_2$  using XRD, SEM and UV Vis NiR Spectroscopy” was submitted by Khairi bin Omar, in partial fulfilment of the requirements for the Degree of Science (Hons.) Industrial Physics, in the Faculty of Applied Sciences, and was approved by



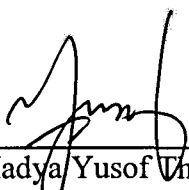
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Lastly, I hope my project will help me to obtain knowledge and exposure in the field of science and technology as well as to introduce some basic techniques and tools that can be used in the future.

## ABSTRACT

### CHARACTERIZATION OF $\text{Li}_4\text{Ca}_2\text{O}_4$ AND $\text{Li}_2\text{MgO}_2$ USING XRD, SEM AND UV Vis NiR SPECTROSCOPY

Material characterization is a method of determine the physical and chemical properties of a certain material. The scanning electron microscope (SEM) is the most widely used type of electron microscope. It examines microscopic structure by scanning the surface of materials, similar to scanning confocal microscopes but with much higher resolution and much greater depth of field. Ultraviolet-visible spectroscopy or ultraviolet-visible spectrophotometry (UV-Vis or UV/Vis) . Ultraviolet-visible spectroscopy or ultraviolet-visible spectrophotometry (UV-Vis or UV/Vis). The absorption in the visible range directly affects the perceived color of the chemicals involved. In this region of the electromagnetic spectrum, molecules undergo electronic transitions. This technique is complementary to fluorescence spectroscopy, in that fluorescence deals with transitions from the excited state to the ground state, while absorption measures transitions from the ground state to the excited state. X-ray diffraction methods are the most effective methods for determining the crystal structure of materials. Diffraction methods can identify chemical compounds from their crystalline structure, not from their compositions of chemical elements. It means that the different compounds (or phases) that have the same composition can be identified

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