

**COMPARATIVE STUDY BETWEEN MICROWAVE HEATING TECHNIQUE AND CONVENTIONAL HEATING TECHNIQUE IN PREPARING Sr<sub>4</sub>Al<sub>14</sub>O<sub>25</sub>:Eu<sup>2+</sup> POWDER SAMPLES**

Izdihar Ishak<sup>a</sup> and Alias Daud<sup>b</sup>

<sup>a</sup>*Matriculation Center, International Islamic University*

<sup>b</sup>*Physics Dept., University of Malaya, Kuala Lumpur*

**ABSTRACT**

Comparative studies were done on the Sr<sub>4</sub>Al<sub>14</sub>O<sub>25</sub>:Eu<sup>2+</sup> samples prepared using the conventional heating technique and microwave heating technique. A simple microwave heating system was designed for firing the phosphor samples. The system consists of metal chamber fitted with an 800W magnetron operating at 2.45 GHz. The synthesis technique prior to the microwave heating will be described. In the conventional method, the samples were sintered in a tube furnace at a temperature of 1200°C for three hours in flowing N<sub>2</sub>/H<sub>2</sub> (90%/10%) environment. However for the samples sintered using microwave, only a quarter of the time is needed. The X-Ray diffraction (XRD) data indicates that the sample is polycrystalline and acquires the host structure. The Photoluminescence (PL) and Photoluminescence Excitation (PLE) spectra for the powder phosphor prepared show similar results as those prepared using the conventional method. The Sr<sub>4</sub>Al<sub>14</sub>O<sub>25</sub>:Eu<sup>2+</sup> powder samples doped with Eu<sup>2+</sup> show strong blue green emission peaking at 538nm. The Scanning Electron Microscope (SEM) picture taken shows that the crystal size of the microwave irradiated samples is smaller in comparison to those prepared using the conventional method. These results indicate that the microwave heating technique is a reliable, fast and suitable technique to produce these powder phosphors. The characteristics of these phosphors are as good as those prepared using the conventional heating technique.

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