

## **The formation of yttrium aluminium monoclinic (Y<sub>4</sub>Al<sub>2</sub>O<sub>9</sub>) by sol-gel synthesis at low heating temperature**

### **ABSTRACT**

Y<sub>4</sub>Al<sub>2</sub>O<sub>9</sub> has been synthesized by means of the citrate-nitrate sol-gel combustion method using yttrium (III) nitrate and aluminium (III) nitrate. DTA/TG analysis, X-ray diffraction (XRD), FT-IR and <sup>27</sup>Al magic angle spinning nuclear magnetic resonance (MAS NMR) measurements were used to characterize the phase decomposition, weight loss of the sample, the crystal structure and phase formation of the Y<sub>4</sub>Al<sub>2</sub>O<sub>9</sub> material. XRD shows the Y<sub>4</sub>Al<sub>2</sub>O<sub>9</sub> starts to crystallize at low temperature, 700°C, with an average particle size around 49 nm.

**Keyword:** <sup>27</sup>Al MAS NMR; DTA/TG; FT-IR; Sol-gel; XRD; YAM (Y<sub>4</sub>Al<sub>2</sub>O<sub>9</sub>)