

The formation of yttrium aluminium monoclinic (Y₄Al₂O₉) by sol-gel synthesis at low heating temperature

ABSTRACT

Y₄Al₂O₉ 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 ²⁷Al 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 Y₄Al₂O₉ material. XRD shows the Y₄Al₂O₉ starts to crystallize at low temperature, 700°C, with an average particle size around 49 nm.

Keyword: ²⁷Al MAS NMR; DTA/TG; FT-IR; Sol-gel; XRD; YAM (Y₄Al₂O₉)