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The effect of annealing temperature on the structure and luminescence of Zn2V2O7 prepared by sol-gel method

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Key words: Vanadate, Crystallinity, Thermogravimetric
Abstract: The zinc vanadate (Zn2V2O7) phosphor was prepared by a sol-gel method followed by annealing at temperatures between 700 ℃ - 850 ℃. The effect of annealing temperature on the structure and photoluminescence of Zn2V2O7 was investigated. The x-ray diffraction (XRD) results showed the single monoclinic phase of Zn2V2O7 [1]. The crystallinity of the Zn2V2O7 phosphor improved while the full width at half-maximum of (022) XRD peak was decreased with the increase in annealing temperature. Scanning electron microscopy (SEM) shows grain size increase with the increase in annealing temperature, which is due to the crystallinity of Zn2V2O7. Thermal behaviour of the Zn2V2O7 phosphor was investigated by thermogravimetric analysis (TGA) and differential scanning calorimetry (DSC). TGA results showed a total weight loss of 65.3% when temperature was risen from 35 ℃ to 500 ℃. The photoluminescence (PL) emission spectra of annealed Zn2V2O7 powders showed a broadband emission from 400 nm to 800 nm. The PL intensity enhanced as the annealing temperature was increased, resulting to an improvement of the crystallinity. PL emission peaks shift from green emission towards a yellow emission.

Reference: [1] P. Y. Zavalij, F. Zhang and M. Stanley Whittingham, Solid State Sciences, 4 (2002) 591–597.

Summary

None

Apply to be
 considered for a student
   award (Yes / No)?

No

Level for award
 (Hons, MSc,
   PhD, N/A)?

N/A

Main supervisor (name and email)
and his / her institution

N/A

Would you like to <br> submit a short paper <br> for the Conference
 Proceedings (Yes / No)?

Yes

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