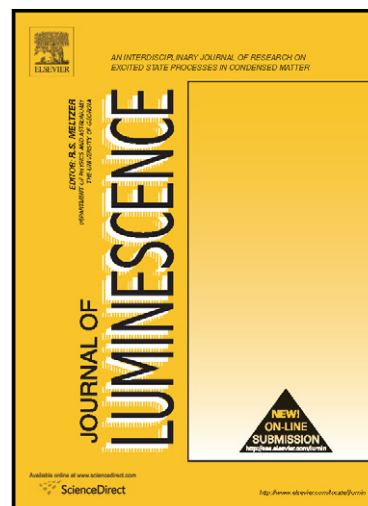


# Author's Accepted Manuscript

Synthesis and photoluminescence properties of red-emitting  $\text{Ca}_{3-3x/2}(\text{VO}_4)_2:\text{xEu}^{3+}$  phosphors

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PII: S0022-2313(14)00697-8  
DOI: <http://dx.doi.org/10.1016/j.jlumin.2014.11.046>  
Reference: LUMIN13047

To appear in: *Journal of Luminescence*

Received date: 30 December 2013  
Revised date: 31 October 2014  
Accepted date: 28 November 2014

Cite this article as: K.Y. Kim, S.J. Yoon, K. Park, Synthesis and photoluminescence properties of red-emitting  $\text{Ca}_{3-3x/2}(\text{VO}_4)_2:\text{xEu}^{3+}$  phosphors, *Journal of Luminescence*, <http://dx.doi.org/10.1016/j.jlumin.2014.11.046>

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## Synthesis and photoluminescence properties of red-emitting

### $\text{Ca}_{3-3x/2}(\text{VO}_4)_2:x\text{Eu}^{3+}$ phosphors

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#### Abstract

Nano-sized and well-dispersed  $\text{Ca}_{3-3x/2}(\text{VO}_4)_2:x\text{Eu}^{3+}$  ( $0.01 \leq x \leq 0.09$ ) powders are prepared by the solution combustion method. The effect of the  $\text{Eu}^{3+}$  concentration and annealing temperature on the photoluminescence properties of  $\text{Ca}_{3-3x/2}(\text{VO}_4)_2:x\text{Eu}^{3+}$  phosphors is investigated.  $\text{Ca}_{3-3x/2}(\text{VO}_4)_2:x\text{Eu}^{3+}$  phosphors show an intense red emission at 613 nm under ultraviolet excitation. The emission intensity increases with an increase in  $\text{Eu}^{3+}$  concentration up to  $x=0.05$  and then decreases with further increase of  $\text{Eu}^{3+}$  concentration.  $\text{Ca}_{2.925}(\text{VO}_4)_2:0.05\text{Eu}^{3+}$  phosphor annealed at 1050 °C shows the strongest emission intensity.

*Keywords:* Vanadate phosphors; Photoluminescence; Annealing; Solution combustion method; Emission

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