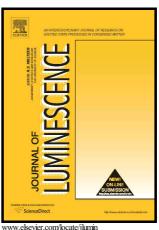
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Effect of flux on the composition and luminescent properties of Ca_{0.68}Mg_{0.2}SiO₃:0.12Eu³⁺ red phosphor

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Abstract: Ca_{0.68}Mg_{0.2}SiO₃:0.12Eu³⁺ red-emitting phosphor was synthesized via one-step calcination process of the precursor prepared by chemical coprecipitation with different fluxes. Then X-ray diffraction and fluorescence spectrophotometry were adopted to investigate the structure and luminescent properties of Ca_{0.68}Mg_{0.2}SiO₃:0.12Eu³⁺. The results indicated that adding fluxes increased the crystalline significantly while the phase composition of samples was not changed. Furthermore, the fluxes improved the intensity of emission peak and the quantum efficiency greatly. With the concentration of flux (Li₂CO₃ or K₂CO₃) increasing, the emission intensity of Ca_{0.68}Mg_{0.2}SiO₃:0.12Eu³⁺ firstly increased and then decreased. Meanwhile, red-shift phenomenon was observed in the emission spectra. The optimal adding fraction of Li₂CO₃ and K₂CO₃ was 6% and 5% respectively, and the luminous intensity of samples calcined with the optimum adding amount of Li₂CO₃, K₂CO₃ is 42 and 48 times that of the samples without flux. K₂CO₃ showed a better effect on improving the emission intensity of the phosphors than Li₂CO₃.

Keywords: Ca_{0.68}Mg_{0.2}SiO₃:0.12Eu³⁺; Flux; Emission intensity; Red phosphor

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