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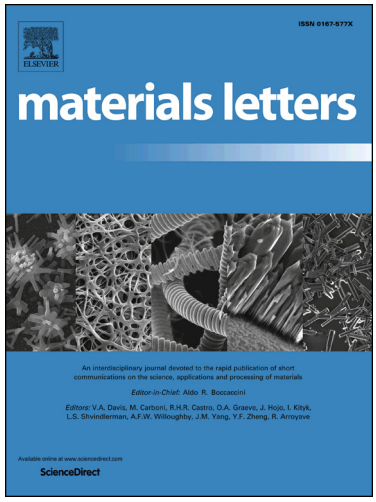

A novel Ce^{3+}: $Y_3Al_5O_{12}$ and Eu^{2+}: $Sr_2Si_5N_8$ dual phosphors-in-glass thick film for warm white LED

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A novel Ce^{3+}: $Y_3Al_5O_{12}$ and Eu^{2+}: $Sr_2Si_5N_8$ dual phosphors-in-glass thick film for warm white LED

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Abstract: As a promising color converter in warm white LEDs, phosphors-in-glass (PiG) thick film is still suffering from the deficiency of high-efficient red phosphors. Herein, commercial Ce^{3+}: $Y_3Al_5O_{12}$ and/or Eu^{2+}: $Sr_2Si_5N_8$ phosphors were successfully embedded into a phosphate glass matrix coated on a soda-lime-silicate glass substrate. Their structural and luminescent properties were respectively investigated by XRD, SEM and photoluminescence spectra analysis. Color-tunable emission was achieved by varying the weight ratio of red to yellow phosphors. After fabricating LED devices with the optimal sample, considerable luminous performance was achieved with luminous efficacy of 72.1 lm/W, correlated color temperature of 5612 K and color rendering index Ra of 82.5. It suggested that the Ce^{3+}: $Y_3Al_5O_{12}$/Eu^{2+}: $Sr_2Si_5N_8$ PiG thick film exhibits a significant potential for high-power warm white LEDs.

Keywords: phosphor-in-glass; thick films; luminescence; warm white LEDs

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