

9th World Congress on

MATERIALS SCIENCE AND ENGINEERING

June 12-14, 2017 Rome, Italy

Preparation and luminescent properties of orange reddish emitting phosphor $\text{KCaBi}(\text{PO}_4)_2:\text{Sm}^{3+}$

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A novel orange reddish light emitting phosphor $\text{KCaBi}(\text{PO}_4)_2:\text{Sm}^{3+}$ for UV excitations has been synthesized by the solid state reaction technique. The powder X-ray diffraction patterns and XPS were utilized to confirm the phase composite and crystal structure. The excitation and emission spectra, decay curves and chromaticity coordinates of the as-prepared phosphors were characterized to investigate the photoluminescence properties for application in white light-emitting diodes. The results revealed that the $\text{KCaBi}(\text{PO}_4)_2:\text{Sm}^{3+}$ phosphors can be effectively assimilated with near ultraviolet excitation at 405 nm, and exhibit four emission bands originating from the $^4\text{G}_{5/2}, ^6\text{H}_{7/2}, ^6\text{H}_{9/2}$ and $^6\text{H}_{11/2}$ transitions of Sm^{3+} ions. The concentration quenching mechanism was verified as dipole-dipole interaction. Additional, $\text{KCaBi}(\text{PO}_4)_2:0.04\text{Sm}^{3+}$ has a better thermal stability and the prepared samples have a potential application in w-LEDs.

Biography

Mi R Y is a PhD student studying at the School of Materials Science and Technology, China University of Geosciences Beijing. She has her expertise in design and structural analysis of the novel rare earth doped phosphors, controllable preparation and luminescence properties of phosphate materials applied for the w-LED and solar cells.

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