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Иркутский научный центр СО РАН

**XV Международная молодежная конференция
по
ЛЮМИНЕСЦЕНЦИИ И ЛАЗЕРНОЙ ФИЗИКЕ**

Село Аршан, Республика Бурятия, Россия,
18–24 июля, 2016 г.

Тезисы лекций и докладов

Иркутск – 2016 г.

SYNTHESIS AND CORE LEVEL PHOTOELECTRON SPECTROSCOPY OF $\text{Sr}_{1.75}\text{Ca}_{1.25}(\text{PO}_4)_2:\text{Eu}^{2+}$ PHOSPHOR

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With intrinsic nature of relatively low sintering temperature, good chemical stability and satisfactory absorption in the ultraviolet (UV)-near UV region, orthophosphate crystals doped with rare earth elements has been widely explored as RGB phosphors. In the present study, the $\text{Sr}_{1.75}\text{Ca}_{1.25}(\text{PO}_4)_2:\text{Eu}^{2+}$ has been prepared by solid state synthesis at 1250 °C for 5 h in a tube furnace under flowing 5% H_2 -95% N_2 reducing atmosphere, and characterized by X-ray powder diffraction to verify the phase composition. Metal-oxygen chemical bonding has been evaluated using core level photoelectron spectroscopy. The constituent element core levels and Eu 3d band have been measured by X-ray photoelectron spectroscopy. Chemical bonding effects were considered using binding energy difference parameters and wide comparison with other oxides bearing Sr^{2+} , Ca^{2+} and P^{5+} ions, and particular attention was given to the Eu-O bonding. The averaged metal-oxygen bond lengths were taken as a structure related parameter.