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Synthesis and photoluminescent properties of Eu^{3+}, Dy^{3+} doped molybdate based novel $Ba_{0.5}Ca_{0.5}La_2(MoO_4)_4$ phosphors

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$Ba_{0.5}Ca_{0.5}La_{2-x-y}(MoO_4)_4:xEu^{3+},yDy^{3+}$ with doping concentrations of xEu^{3+} and yDy^{3+} (x =0.01, 0.03, 0.05, 0.1 and y= 0.01) phosphors were synthesized by solid state reaction method, one of the high temperature solid state methods. The reactions were carried out in tube furnace at determined temperatures. Thermogravimetry-differential thermal analysis (TG/DTA) system was used to determine the synthesis temperature of the material and to examine its thermal behavior. The crystal structure of the material was checked with x-ray powder diffractometry (XRD), surface morphology and elemental analysis were done with scanning electron microscope (SEM). The photoluminescent properties of luminescence and excitation wavelength and luminescence duration were determined by photoluminescence spectrophotometer (PL). As a result of the analyses made with photoluminescence spectrophotometer, three emission bands were observed at 619 nm, 652 nm and 706 nm, resulting from the characteristic $^5D_0 \rightarrow {}^7Fj$ (J=2, 3 and 4) transitions of Eu^{3+} ions.

Keywords: Photoluminescence, XRD, Eu^{3+}, Molibdates