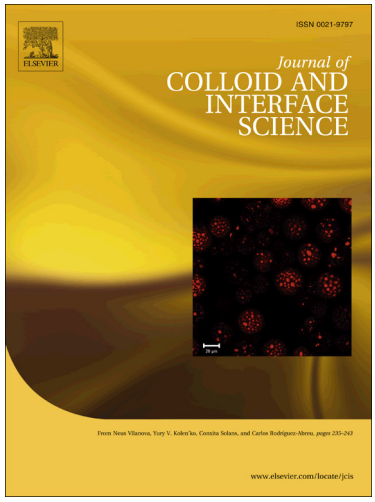

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PII: S0021-9797(17)30462-9
DOI: http://dx.doi.org/10.1016/j.jcis.2017.04.062
Reference: YJCIS 22274

To appear in: *Journal of Colloid and Interface Science*

Received Date: 4 January 2017
Revised Date: 16 April 2017
Accepted Date: 20 April 2017

Please cite this article as: L. Zhang, B. Dong, G. Wang, R. Gao, G. Su, W. Wang, L. Cao, Controllable Synthesis and Luminescent Properties of Rare Earth Doped $Gd_2(MoO_4)_3$ Nanoplates, *Journal of Colloid and Interface Science* (2017), doi: http://dx.doi.org/10.1016/j.jcis.2017.04.062

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Abstract

For the first time, we have successfully synthesized rare-earth doped $Gd_2(MoO_4)_3$: RE^{3+} (RE=Eu,Tb) nanoplates by solvothermal method. The morphology of $Gd_2(MoO_4)_3$ can be manipulated by changing the reaction times and reaction temperatures. The composition and surface morphology have been investigated by X-ray powder diffraction (XRD) and transmission electron microscopy (TEM), respectively. Under the excitation of UV, Photoluminescence (PL) has been used to explore the excellent luminescence properties of the synthesized nanophosphors. The $Gd_2(MoO_4)_3$: Eu^{3+} phosphors shows a hypersensitive red emission (612 nm) when excitation wavelength within the scope of 200-350 nm corresponding to a $^5D_0$-$^7F_2$ transition. Similarly, the $Gd_2(MoO_4)_3$: Tb^{3+} phosphors certificate a highly strong green emission at 544 nm at an excitation wavelength of 298 nm corresponding to a $^5D_4$-$^7F_5$ transition. Furthermore, the characteristic spectrum peak of the $Gd_2(MoO_4)_3$: Eu^{3+}/Tb^{3+} nanophosphor exhibits the corresponding spectra position (green emission at 544 nm and red emission at 612 nm). Hence, the obtained $Gd_2(MoO_4)_3$: RE^{3+} nanoplates may establish highly potentiality in light field applications.

Keywords: $Gd_2(MoO_4)_3$; Nanoplates; Solvothermal; Lanthanide doped; Luminescent