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Dopant concentration dependent optical and X-Ray induced photoluminescence in Eu^{3+} doped $La_2Zr_2O_7$[1] MADHAB POKHREL, Univ of Texas, Pan American, MIKHAIL BRIK, University of Tartu, YUANBING MAO, Univ of Texas, Pan American — Herein, we will be presenting the dopant (Eu) concentration dependent high density $La_2Zr_2O_7$ nanoparticles for optical and X-ray scintillation applications by use of X - ray diffraction, Raman, FTIR, scanning electron microscope (SEM), transmission electron microscopy (TEM), optically and X-ray excited photoluminescence (PL). Several theoretical methods have been used in order to investigate the structural, electronic, optical, elastic, dynamic properties of Eu doped $La_2Zr_2O_7$. It is observed that Eu: $La_2Zr_2O_7$ shows an intense red luminescence under 258, 322, 394 and 465 nm excitation. The optical intensity of Eu: $La_2Zr_2O_7$ depends on the dopant concentration of Eu^{3+}. Following high energy excitation with X-rays, Eu: $La_2Zr_2O_7$ shows an atypical Eu PL response (scintillation) with a red emission. The intense color emission of Eu obtained under 258 nm excitation, the X-ray induced luminescence property along with reportedly high density of $La_2Zr_2O_7$, makes these nanomaterials attractive for optical and X-ray applications.

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