Study of structural and thermal properties of Sm_2O_3 doped Calcium Boroaluminate

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In the last decades, rare-earth (RE) ions doped solid-state materials have been a subject of considerable interest due to their applicability as solid-state laser, amplifiers, infrared-to-visible, phosphors, and field emission displays. Calcium boroaluminate glasses are the promising hosts for many optical applications because they are materials with a good combination of thermal, mechanical and optical properties that could be exploited in. The samarium ion (Sm^{3+}) presents wide emission in the visible range, allowing its application in tunable lasers in the visible and with light emitting diodes. Its lowest emitting level $^4G_{5/2}$ has relatively high quantum efficiency and shows different quenching mechanism. Samples of calcium boroaluminate glass (CaBAl) with composition of (25-x)CaO-50B_2O_3-15Al_2O_3-10CaF_2- xSm_2O_3 with samarium concentration varying from 0,50 a 7wt% were prepared by the conventional melting-quenching technique in this work. For the samples characterization, measurements of density, Raman spectra, FTIR, X-ray diffraction, thermal analysis (DTA) and specific heat (c_p) were performed. The results of this study are discussed in terms of the structural change in the network of CaBAl glasses with the addition of Sm_2O_3.

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