Abstract

During recent years, there has been a great interest on the synthesis, structural and physical properties of oxide glasses duo to their high thermal stability, good mechanical properties, easy shaping and possibility of manufacturing in large scale. Research focuses on new materials and processes. Performance and cost materials are required for all applications. To meet these objectives, the sol gel process is particularly suitable for preparing homogeneous materials with high purity at lower temperature. Moreover, this approach is a better able to control the composition and a microstructure of the glass host. The sol gel route is also a technique of choice for fabricating a multicomponent oxide glasses. Among various types, silica and borosilicate host matrix obtained by melting or sol gel process are the most important glass system used in various fields of applications. It has many favorable properties such as a broad transmission range from ultraviolet to infrared; a low nonlinear index of refraction and a low coefficient of thermal expansion. These glasses doped with rare earth ions have received great attention because their potential applications as fiber and planar optical devices or as scintillators for ionizing radiation detection [1, 5]. Ce^{+3} activated glasses appear to be promising materials for scintillation applications in medical imaging and high energy physics. Numerous investigations were recently related to the optical properties of Ce^{+3} based silica glasses obtained by sol gel process [6, 11]. In the present study we report the preparation and structural evolution of glass matrix derived from Gd_2O_3-B_2O_3-SiO_2 doped with Ce^{+3} ions Our goal was to improve the performance of GBS glass matrix by controlling their preparation on a nanometric scale using the sol gel process. Structural and textural characterization was investigated by various techniques, XRD, FTIR, DSC and BET method. Copyright