

Optical Properties of Pr³⁺ Doped Silica Gel Glasses Obtained by Sol-Gel Method

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The thermally densified silica glasses doped with Pr³⁺ ions were prepared by sol-gel method. The procedure of preparation is described.

Absorption, emission and excitation spectra of Pr³⁺ doped silica glasses obtained by sol-gel method are reported. We have found that the intensities of absorption bands of Pr³⁺ changed with concentration, in particular a strong increase of ³P₂ term intensity was observed.

The luminescence spectra were dependent on excitation wavelength. The spectra excited in high UV range exhibited, besides an emission in the red range corresponding to the ¹D₂ → ³H₄ transition, a broad band emission with the characteristic holes at the envelope corresponding to the ³P₂, (³P₁, ¹I₆) and ³P₀ terms. The nature of the broad band emission is discussed. The observed holes are resulting from reabsorption processes, however their mechanism is unknown. No emission from ³P₀ level was observed. The emission processes were strongly temperature and concentration quenched.