

OPTICAL PROPERTIES OF Pr DOPED SILICA GLASS OBTAINED BY SOL-GEL METHOD

W. Stręk, E. Lukowiak and K. Maruszewski

Institute for Low Temperature and Structure Research, Polish Academy of Sciences, 50950 Wrocław, Poland

J. Legendziewicz, J. Sokolnicki

Institute of Chemistry, University of Wrocław, Poland

A. A. Boiko

Gomel State University, Gomel, Belarus.

The thermally densified silica glasses doped with Pr ions were prepared by sol-gel method. The procedure of preparation is described. Absorption, emission and excitation spectra of Pr doped silica glasses obtained by sol-gel method are reported. We have found that the intensities of absorption bands of Pr(III) changed with concentration, in particular a strong increase of 3P_2 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 $^1D_2 \rightarrow ^3H_4$ transition a broad band emission with the characteristic holes at the envelope corresponding to the 3P_2 , (3P_1 1I_6) and 3P_0 terms. The nature of broad band emission is discussed. The observed holes are resulting from a reabsorption processes however their mechanism is unknown. No emission from 3P_0 level was observed. The emission processes were strongly temperature and concentration quenched.