

Absorption and photoluminescence of Ga_{0.017}Ge_{0.25}As_{0.083}S_{0.65} glasses doped with rare-earth ions

M. S. Iovu, A. M. Andriesh, E. V. Lupan, V. I. Ciornea, N. N. Syrbu

<https://doi.org/10.1117/12.757919>

Abstract

The visible luminescence from Pr³⁺, Dy³⁺, Nd³⁺, Sm³⁺ and codoped with Ho³⁺ and Dy³⁺ ions embedded in Ga_{0.017}Ge_{0.25}As_{0.083}S_{0.65} glass hosts at room temperature and at T=10 K is reported, when pumping with an Ar⁺-ion laser at $\lambda=488$ nm. Fluorescence emissions at 1.3 μm was observed for Dy³⁺ and both at 1.3 and at 1.5 μm for Pr³⁺ doped glasses with wavelength pumping at 950 nm. Energy transfer from Ho³⁺:⁵F₃ level to Dy³⁺:⁴F_{9/2} level increase the visible emission efficiency at 650 nm in the codoped glasses. The investigated Ga_{0.017}Ge_{0.25}As_{0.083}S_{0.65} glasses doped with Pr³⁺ are promising amplifier materials for 1.3 and 1.5 μm fiber optic telecommunication windows.