

Effects of F⁻ on the optical and spectroscopic properties of Yb³⁺/Al³⁺-co-doped silica glass.

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Streszczenie

Yb³⁺/Al³⁺-co-doped silica glasses with different F⁻ content were prepared in this work by sol-gel method combined with high temperature sintering. XRF, FTIR and XPS methods were used to confirm the presence of F⁻. The effects of F⁻ on the optical and spectroscopic properties of these glasses have been investigated. It is worth to notice that the F⁻/Si⁴⁺ mass ratio equal to 9% is a significant value showing a real change in the variation trends of numerous following parameters: refractive index, UV absorption edge, absorption and emission cross sections, scalar crystal-field N_j and fluorescent lifetimes. Furthermore, introduction of F⁻ can adjust the refractive index of Yb³⁺/Al³⁺-co-doped silica glass and it is useful for large mode area (LMA) fibers.

Słowa kluczowe

silica glass, Yb³⁺ spectroscopy, F and Al influences, refractive index

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