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Dynamics of the UV-Induced Absorption of Laser Light by Color Centers in Crystalline KY₃F₁₀:Ce³⁺,Yb³⁺

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Abstract

© 2014, Springer Science+Business Media New York. A pump-probe method is used to study the dynamics of the destruction of color centers in KY₃F₁₀:Ce³⁺ and KY₃F₁₀:Ce³⁺,Yb³⁺ crystals by continuous UV radiation and to measure its parameters. The effect of Yb³⁺ ions in crystalline KY₃F₁₀:Ce³⁺,Yb³⁺ on the rate of bleaching of color centers in it under exposure to the probe light is studied. Irradiation of KY₃F₁₀:Ce³⁺ and KY₃F₁₀:Ce³⁺,Yb³⁺ crystals at a wavelength corresponding to an absorption band of a color center accelerates the destruction of the color centers and the reduction of Yb²⁺ ions to the trivalent state in proportion to the density of the radiation. A model is constructed for the bleaching mechanism that can be used to estimate the ionization cross section of the color centers.

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Keywords

absorption from an excited state, color centers, pump-probe method