ZnGa$_2$O$_4$:Cr$^{3+}$ nanophosphors with an average crystallite size of 5 nm were prepared by a combustion method. We observed changes in luminescence properties compared with micro-crystalline system, such as highly efficient Cr$^{3+}$ emission and a decrease in the persistent luminescence decay time of the near-infrared emission. We observe a little change in the band gap. The emission intensity of the efficient broad band at near-infrared emission was very high, under excitation in the UV, blue and green wave lengths. The system presents good stability in colloidal suspensions of water and glucose and conserve their luminescence properties. The system shows applications in-vivo optical imaging due to the rather high penetration depth of near infrared radiation into human tissue. Its small crystallite size allows to enter cells for bioimaging, non-toxicity, good dispersion in the biological environment and resistant to photobleaching.

Keywords: ZnGa2O4:Cr3+, Nanoparticles, Persistent luminescence

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