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PHYSICOCHEMICAL, SPECTRAL-LUMINESCENT AND LASING PROPERTIES OF YB-CONTAINING HUNTITE-LIKE GLASS

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The glasses of the $(Yb_xY_{1-x})_2O_3-Al_2O_3-B_2O_3$ with composition close to the huntite stoichiometry was synthesized and their multi-aspect investigation was carried out. It was established that the glasses are characterized by (1) low efficiencies of cooperative luminescence of Yb-Yb pairs and photo bleaching and photo darkening caused by charge exchange of the activator ions as well as by high threshold of laser-induced destruction of the glass surface; (2) the $^2F_{5/2} \rightarrow ^2F_{7/2}$ luminescence band effective width and its limiting quantum yield consist of about 33 nm and 94% respectively; (3) heat conductivity increases from 0.6 to 0.9 W/mK with rise of Yb_2O_3 concentration from 0.5 to 10 mol. % and may grow up to 1.3W/mK at additional doping with Sb; (4) the nonlinear index of refraction close to 2.2×10^{-13} esu. These glasses lasing parameters at the both free-running mode and Q-switched operation were studied and obtained results were compared with the similar parameters of known glasses activated with Yb^{3+} ions.

Biography

Georgii Malashkevich defended his PhD degree in Physics and Mathematics in 1978 from the Institute of Physics of the BSSR Academy of Sciences and the Doctor of Science degree in Physics and Mathematics in 2003 from the Institute of Molecular and Atomic Physics of the NAS of Belarus. He is the Head of the A N Sevchenko Laboratory of Photophysics of Activated Materials, B I Stepanov Institute of Physics of the NAS of Belarus. He has published more than 80 papers in reputed journals and about 100 patents on invention of Belarus, Russia and the former USSR, as well as he is a member of the Advisory Editorial Board of the *J Appl Spectros*.

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