

Mathematical and computer modeling of nanocrystalline structure of IR-fibers: experimental study of their functional properties

© **Dmitry S. Wrublewski, Lia V. Zhukova,*⁺**
Alexander S. Korsakov, and Dmitry D. Salimgareev

Department of Physical and Colloid Chemistry. Ural Federal University n.a. First President of Russia Boris Yeltsin. Mira St., 19. Ekaterinburg, 620002. Russia. Phone: +7 (343) 375-44-45. E-mail: l.v.zhukova@ustu.ru

*Supervising author; ⁺Corresponding author

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Abstract

New infrared optical fibers have been developed on the basis of solid solutions of silver halides and monovalent thallium, having a number of unique properties that lead to their feasibility in many areas of science and technology. Two- and three-dimensional models of the laser radiation through the core of the optical fiber have been designed. Single-mode conditions, as well as the main characteristics of optical fibers have been computed. We verified the calculation of the normalized frequency for IR fibers with the increased diameter of the mode field. Through the introduction of the original monovalent thallium iodide crystals optical losses were reduced and transmission range of the new infrared optical fibers was extended.