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Investigations of tellurite glasses for optoelectronics devices

Edmund Pawel Golis, Manuela Reben, Jan Wasylak, Jacek Filipecki

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Abstract

The goal of the work was to characterize and synthesize tellurite glasses from the TeO_2–WO_3–PbO–La_2O_3 system. The effect of lanthanum oxide content on the tendency to the crystallization of glassy matrix was investigated. Differential thermal analysis DTA/DSC, XRD measurement were considered in terms of the lanthanum oxide influence. Presented work is a continuation of investigations of tellurite glasses with use of the Faraday effect method. The Faraday effect is a rotation of polarization of linearly polarized light in an isotropic transparent material under the magnetic field. It has been stated that the addition of lanthanum to tellurite glass from the TeO_2–WO_3–PbO system hinders the crystallization process of glass which is very important during fiber drawing. Tellurite glasses have physical and chemical properties that make this class of materials a potential candidate in different applications, such as electrochemical and optoelectronic devices. In the field of photonics these glasses may be used as precursors for infrared fibers or windows due to the possibility of changing their phonon energies and therefore the domain of wavelength transparency as a function of compositions.

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