The approaches to the synthesis of promise luminescence materials

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Luminescence in materials containing rare earth elements is of great interest due to their broad application in optoelectronics and laser technologies. Today luminescent materials are produced in the form of single crystals, nanoparticles and nanopowders, glass, ceramics and glass-ceramics.

The present paper contains data on Lanthanum Zirconate- and Ceriumbased complex oxide materials as well as REE ions-activated oxyfluoride glassceramics, distinct for their high-intensity luminescence and long afterglow.

Application of various parent matrix compositions as well as variation of combinations and concentrations of activator ions ensure effective conversion of IR and UV radiation into the visible spectrum, also allow for obtainment of glass materials with long luminescence afterglow under UV and visible light excitation. Use of different methods of synthesis of these materials as well as their combinations leads to obtainment of luminescent materials in the form of nano- and ultra-disperse powders, ceramics and glass-ceramics, as well as to broad variation of their structures and properties [1-3].

The developed complex oxide and oxyfluoride optical materials, activated by REE ions, have great potential for application as IR radiation visualizers, multicolor luminophores and active laser media. Glass-ceramics with highintensity afterglow can be used as an element of paints used for road markings for lighting required at night time.

- 1. E. Trusova, R. Klement, Y. Tratsiak, Ľ. Bača, P. Veteška, M. Janek. Int. J. Nanosci. 18 (2019) 1940081.
- 2. G. Arzumanyan, V. Vartic, A. Kuklin, D. Soloviov, G. Rachkovskaya, G. Zacharevich, E. Trusova, N. Skoptsov, K. Yumashev. Journal of Physical Science and Application. **4** (2014) 150.
- 3. S.E. Kichanov, Yu.E. Gorshkova, G.E. Rachkovskaya, D.P. Kozlenko, G.B. Zakharevich, B.N. Savenko. Mater. Chem. Phys. **237** (2019) 121830.