Multicomponent Metal Oxide Systems for Optical and Magnetic Applications

Aivaras Kareiva, Inga Grigoraviciute-Puroniene, Olga Opuchovic, Dovydas Karoblis, Andrius Pakalniskis, Zivile Stankeviciute, Aleksej Zarkov

Institute of Chemistry, Vilnius University of Latvia, Lithuania

e-mail: aivaras.kareiva@chgf.vu.lt

The phosphors host materials have proven to be of great importance for the optical function. Transition metal and rare-earth element ions have demonstrated lasing action in a wide variety of host crystals. Among the compounds which can incorporate transition metals or lanthanides several multicomponent metal oxide systems were elaborated [1-3].Rare-earth aluminium garnets have also attracted considerable attention as host crystals for near-infrared solid-state lasers as well as for optoelectronics devices, including computer memories, microwave optical elements and as laser active media with applications in medical surgery and optical communications.

In recent years magnetic materials have been in the focus of interest, with much attention paid to their potential usage in modern technologies. Magnetic disks are used to read and write information, hard disk drives are used for storage of information. Iron containing garnets, perovskites and spinels with non-equivalent and antiferromagnetically coupled spin sublattices represent important classes of soft magnetic materials [4, 5]. The ferrimagnetic rare earth iron garnets, R3Fe5O12, are unique group of materials, which have been long studied for their novel magnetic and magneto-optical properties.

The main aim of this study was to prepare different multifunctional mixed-metal oxides and investigate their suitability for usage as optical and magnetic materials.

**Acknowledgements.** The work has been done in frame of the project TransFerr. This project has received funding from the European Union’s Horizon 2020 research and innovation programme under the Marie Sklodowska-Curie grant agreement No. 778070.

References

1. L. Pavasaryte, A. Katelnikovas, V. Klimavicius, V. Balevicius,A. Momot, M. K. Van Bael, A. Hardyand A. Kareiva. New J. Chem.,**42** (2018) 2278-2287.
2. S. Butkute, E. Gaigalas, A. Beganskiene, F. Ivanauskas, R. Ramanauskas and A. Kareiva. J. All. Cmpd., **739** (2018) 504-509.
3. L. Pavasaryte, A. Katelnikovas, V. Klimavicius, V. Balevicius, A. Krajnc, G. Mali, J. Plavec and A. Kareiva. Phys. Chem. Chem. Phys.,**19** (2017) 3729-3737.
4. O. Opuchovic, D. Niznansky and A. Kareiva. J. Therm. Anal. Calorim., **130** (2017) 1085-1094.
5. O. Opuchovic, S. Culunlu, A. U. Morkan, I. A. Morkan, D.Niznansky, E. Garskaite, A. Beganskiene and A. Kareiva. Chem. Eng. Commun.. **204** (2017) 1037-1048.