

# Table of content of OMEE-2017 conference papers volume accepted for publication in Acta Physica Polonica A journal, volume 133 (2018)

## Technology of the active media for electronic engineering

V.I. Lutsyk, V.P. Vorob'eva, A.E. Zelenaya, *3D Computer Models of the Ag-Sb-Sn and MgO-Al<sub>2</sub>O<sub>3</sub>-SiO<sub>2</sub> T-x-y Diagrams*

V. Shulgov, *Thermal stability of porous anodic alumina formed in electrolytes with surfactant additives*

B. Kazarkin, Y. Mukha, A. Stsiapanau, A. Smirnov, *Image formation by ink-jet printing in micro- and nanoporous anodic alumina film with capsulating*

V.T. Gritsyna, Yu.G. Kazarinov, V.A. Kobayakov, L.A. Lytvynov, *Growth and characterization of titanium doped spinel crystals*

A.P. Mukhachov, O.A. Kharitonova, O.A. Terentieva, *Hafnium Oxide as Efficient Material for a New Generation Dielectric*

## Active media fundamentals: crystal structure and defects

G.F. da C. Bispo, R. A. Jackson and M.E.G. Valerio, *Modelling of Intrinsic defects in CaYAl<sub>3</sub>O<sub>7</sub>*

U. Rogulis, A. Fedotovs, A. Antuzevics, Dz. Berzins, Ya. Zhydachevskyy, D. Sugak, *Optical detection of paramagnetic centres in activated oxyfluoride glass-ceramics*

T. Prikhna, O. Ostash, V. Sverdun, M. Karpets, T. Zimych, A. Ivasyshin, Th. Cabioc'h, P. Chartier, S. Dub, L. Javorska, V. Podgurska, P. Figel, J. Cyboron, V. Moshchil, V. Kovylaev, S. Ponomaryov, V. Romaka, T. Serbeuk, A. Starostina, *Presence of oxygen in Ti-Al-C MAX phases-based materials and their stability in oxidizing environment at elevated temperatures*

V.O. Vasylechko, E.T. Stechynska, O.D. Stashkiv, G.V. Gryshchouk, I.O. Patsay, *Sorption of neodymium and gadolinium on Transcarpathian clinoptilolite*

O. Pekinchak, D.Yu. Sugak, S.B. Ubizskii, Yu. Suhak, H. Fritze, L. Vasylechko, *Thermal Behaviour of PrCo<sub>1-x</sub>Fe<sub>x</sub>O<sub>3</sub> Probed by X-ray Synchrotron Powder Diffraction and Impedance Spectroscopy Measurements*

O. Pavlovska, I. Lutsyuk, Ya. Vachula, A. Kondyr, Ya. Zhydachevskii, A. Pieniżek, L. Vasylechko, *Synthesis and structure characterisation of micro- and nanocrystalline powders of Dy<sub>1-x</sub>R<sub>x</sub>FeO<sub>3</sub> (R = La, Pr, Nd, Sm, Gd)*

S.S. Novosad, I.S. Novosad, O.M. Bordun, L.V. Kostyk, I.O. Bordun, O.Ya. Tuzyak, *The Influence of Europium Impurity on the Recombination Luminescence in Y<sub>2</sub>O<sub>3</sub>*

A. Luhechko, V. Vasylytsiv, L. Kostyk, O. Tsvetkova, *Origin of Point Defects in  $\beta$ -Ga<sub>2</sub>O<sub>3</sub> Single Crystals Doped with Mg<sup>2+</sup> Ions*

T.V. Kruzina, V.M. Sidak, M.P. Trubitsyn, S.A. Popov, A.Yu. Tuluk and J. Suchanicz, *Impedance spectra of as-grown and heat treated Na<sub>0.5</sub>Bi<sub>0.5</sub>TiO<sub>3</sub> crystals*

P.A. Shchepanskyi, V.M. Gaba, V.Yo. Stadnyk, M.Ya. Rudysh, R.S. Brezvin, M. Piasecki, *The Influence of Partial Isomorphic Substitution on Electronic and Optical Parameters of ABSO<sub>4</sub> Group Crystals*

S.I. Kachan, V.M. Salapak, O.A. Nagurskiy and I.B. Pirko, *Control of radiation sensitivity of the oxygen-containing fluorite crystals*

## Nanoparticles, nano-ceramics and nano-composites

S.G. Nedilko, *Polymer- oxide composites: toward new optical materials*

M. Nediello, O. Alekseev, V. Chornii, K. Kovalov, M. Lazarenko, S.G. Nedilko, V. Scherbatskyi, V. Boyko, V. Sheludko, *Structure and properties of oxides incorporated micro/nanocellulose "ceramics – like" composite materials*

V.P. Chornii, S.G. Nedilko, K.L. Bychkov, K.V. Terebilenko, M.S. Slobodyanik, V.V. Boyko, *Synthesis and luminescence properties of Pr<sup>3+</sup>- doped BiPO<sub>4</sub> polycrystals*

M. Derhachov, V. Moiseienko, N. Kutseva, B. Abu Sal, R. Holze, S. Pliaka and A. Yevchyk, *Structure, optical and electric properties of opal – bismuth silicate nanocomposites*

I.B. Olenych, O.I. Aksimentyeva, B.R. Tsizh, Yu.Yu. Horbenko, *Transport and Relaxation of Charge in Organic-Inorganic Nanocomposites*

N. Andrushchak, B. Kulyk, P. Göring, A. Andrushchak and B. Sahraoui, *Study of Second Harmonic Generation in KDP/Al<sub>2</sub>O<sub>3</sub> Crystalline Nanocomposite*

N. Andrushchak, N. Jaworski, M. Lobur, *Improvement of the Numerical Method for Effective Refractive Index Calculation of Porous Composite Materials Using Microlevel Models*

I. Bolesta, M. Vakiv, V. Haiduchok, O. Kushnir, A. Demchuk, S. Nastyshyn, R. Gamernyk, *Optical Properties of LiNbO<sub>3</sub>-Ag Nanocomposites*

H. Klym, A. Ingram, O. Shpotyuk, I. Hadzaman, D. Chalyy, *Water-sorption effects near grain boundaries in modified MgO-Al<sub>2</sub>O<sub>3</sub> ceramics tested with positron-positronium trapping algorithm*

Z.A. Duriagina, T.L. Tepla, V.V. Kulyk, *Evaluation of differences between Fe<sub>3</sub>O<sub>4</sub> micro- and nanoparticles properties*

A. Mizera, E. Drożdż, Ł. Łańcucki, *Synthesis of highly porous SrTiO<sub>3</sub> materials*

R. Lisovsky, B. Ostafiychuk, I. Budzulyak, V. Kotsyubynsky, A. Boychuk, B. Rachiy, *Nanostructured iron-substituted lithium-manganese spinel as an electrode material for hybrid electrochemical capacitor*

Iu. Kogut, S. Nickalo, V. Ohorodniichuk, A. Dauscher, C. Candolfi, P. Masschelein, A. Jacquot, B. Lenoir, *Nanostructure Features, Phase Relationships and Thermoelectric Properties of Melt-spun and Spark-Plasma-Sintered Skutterudites*

A. Smalenskaite, S. Şen, A. N. Salak, M. G. S. Ferreira, A. Beganskiene, A. Kareiva, *Sol-Gel Derived Lanthanide-Substituted Layered Double Hydroxides Mg<sub>3</sub>/Al<sub>1-x</sub>Ln<sub>x</sub>*

## Resistivity switching and transport phenomena

Jwayeon Kim, Yongkyu Ko, Kyeongsoon Park, *Effect of RF Magnetron Sputtered Nickel Oxide Thin Films as an anode buffer layer in a P<sub>3</sub>HT:PCBM bulk hetero-junction solar cell*

O.O. Nesterov, M.P. Trubitsyn, S.G. Nedilko, M.D. Volnianskii, S.M. Plyaka, Ya.O. Rybak, *Ionic conduction in multiphase Li<sub>2</sub>O-7GeO<sub>2</sub> compounds*

H. Zenk, *Comparison of Electrical Performances of Power Electronics Switches and An Effective Switch Selection Algorithm*

## Materials for quantum and optoelectronics and detectors of radiation

K. Park, D.A. Hakeem, J. Kim, Y. Kim, S.-J. Kim, *Structural and optical properties of hydrothermally synthesized ZnO and Zn<sub>0.99</sub>O:Eu<sup>3+</sup> powders*

I.N. Demchenko, Y. Melikhov, P. Konstantynov, R. Ratajczak, A. Barcz, E. Guziewicz, *Resonant Photoemission Spectroscopy study on the contribution of the Yb4f states to the electronic structure of ZnO*

O.M. Bordun, B.O. Bordun, I.I. Medvid, I.Yo. Kukharskyy, *Structure and thermally stimulated luminescence of  $\beta$ -Ga<sub>2</sub>O<sub>3</sub> thin films*

I.O. Bordun, O.M. Bordun, I.Yo. Kukharskyy, Zh.Ya. Tsapovska, *Structure and cathodoluminescence of Y<sub>2</sub>O<sub>3</sub>:Eu thin films obtained at different conditions*

O. Chukova, S.G. Nedilko, *Spectroscopy of the Yb<sup>3+</sup> ions in the PbWO<sub>4</sub> crystal*

D. V. Kasperovych, F. A. Danevich, V. V. Kobychyev, B. N. Kropivnyansky, A. I. Tymoshenko, *Low background CdWO<sub>4</sub> scintillation detector*

A.S. Andrushchak, O.A. Buryy, N.M. Demyanyshyn, Z.Yu. Hotra, B.G. Mytsyk *Global Maxima of the Acousto-Optic Effect in CaWO<sub>4</sub> Crystals*

N. Ftomyn, Ya. Shopa, I. Sudak, *Calculation of linear electro-optic coefficients in La<sub>3</sub>Ga<sub>5</sub>SiO<sub>14</sub> crystals*

A.O. Dyachenko, T.V. Panchenko, *Thermochromic effect in doped Bi<sub>12</sub>SiO<sub>20</sub> crystals*

K.V. Agarkov, L.Ya. Sadovskaya, *Conductivity effects in Bi<sub>2</sub>TeO<sub>5</sub> single crystals*

L. Kostyk, A. Luchechko, S. Novosad M. Panasyuk, M. Rudko, O. Tsvetkova, *Recombination luminescence in Ca<sub>3-x</sub>Cd<sub>x</sub>Ga<sub>2</sub>Ge<sub>3</sub>O<sub>12</sub> Garnets doped with Eu<sup>3+</sup> Ions*

T. Zorenko, V. Gorbenko, S. Nizankovskiy, Yu. Zorenko, *Comparison of the luminescent properties of Y<sub>3</sub>Al<sub>5</sub>O<sub>12</sub>:Pr crystals and films under synchrotron radiation excitation*

I.I. Syvorotka, D.Yu. Sugak, A.P. Luchechko, Ya.A. Zhydachevskyy, S.B. Ubizskii, *Optical Properties of GGG Epitaxial Films Grown from PbO-B<sub>2</sub>O<sub>3</sub>-V<sub>2</sub>O<sub>5</sub> Flux*

D. Sugak, I.I. Syvorotka, U. Yakhnevych, O. Buryy, M. Vakiv, S. Ubizskii, D. Włodarczyk, Ya. Zhydachevskyy, A. Pieniążek, R. Jakiela, A. Suchocki, *Investigation of Co Ions Diffusion in Gd<sub>3</sub>Ga<sub>5</sub>O<sub>12</sub> Single Crystals*

D. Sugak, I.I. Syvorotka, U. Yakhnevych, O. Buryy, N. Martynyuk, S. Ubizskii, Ya. Zhydachevskyy, A. Suchocki, *Optical Investigation of the Cu Ions Diffusion into Bulk Lithium Niobate*

Ya. Zhydachevskyy, M. Glowacki, N. Martynyuk, S. Ubizskii, M. Berkowski, A. Suchocki, *Effect of lutetium co-doping on the main dosimetric peak of YAP:Mn<sup>2+</sup> TL detectors*

Ya. Zhydachevskyy, I. Kamińska, M. Glowacki, A. Kilian, S. Ubizskii, P. Bilski, M. Berkowski, K. Fronc, D. Elbaum, A. Suchocki, *Photoluminescence and thermoluminescence of the oxygen-deficient YAG, YAP and YAM phosphors*

A.B. Danylov, H.A. Ilchuk, R.Yu. Petrus, *Effect of HRT ZnO Film on Optical Spectra of Transmission in CdS/CdTe Solar Elements*

V.Ya. Degoda, M. Alizadeh, N.V. Martynyuk, N.Yu. Pavlova, *Dose dependencies of the conductivity and luminescence in ZnSe single crystals*

S.V. Syrotyuk, V.M. Shved, Yu.V. Klysko, *The quasiparticle electronic energy bands of the cubic KMgF<sub>3</sub> perovskite under pressure effect*

I. A. Ivashchenko, V.V. Halyan, A.H. Kevshyn, T.Y. Kubatska, V.M. Rosolovska, P.V. Tishchenko, I. D. Olekseyuk, *Physical properties of the (Ga<sub>70</sub>La<sub>30</sub>)<sub>2</sub>S<sub>300</sub>, (Ga<sub>69.75</sub>La<sub>29.75</sub>Er<sub>0.5</sub>)<sub>2</sub>S<sub>300</sub> single crystals*

H. Kumar, V. Janyani, O. Buryy, S. Ubizskii, D. Sugak, Gh. Singh, *Eight channel Optical Add Drop Multiplexer based on Ring Resonator using LNOI channel waveguides*

Sh. Kalra, S. Vyas, M. Tiwari, O. Buryy, Gh. Singh, *Highly nonlinear multi-material Chalcogenide spiral photonic crystal fiber for Supercontinuum Generation*

### Magnetic materials, multiferroics, superconductors

G. Suchaneck, G. Gerlach, *Combining Diacritical Marks Electrocaloric Cooling - A New Application of Relaxor Ferroelectrics*

A. Belous, A. Tovstolytkin, S. Solopan, Yu. Shlapa, O. Fedorchuk, *Synthesis, Properties and Applications of Some Magnetic Oxide Based Nanoparticles and Films*

N. Mironova-Ulmane, A. Kuzmin, V. Skvortsova, G. Chikvaidze, I. Sildos, J. Grabis, D. Jankoviča, A. Dindune, M. Maiorov, *Synthesis and Vibration Spectroscopy of Nano-Sized Manganese Oxides*

A.I. Tovstolytkin, Yu.Yu. Shlapa, S.O. Solopan, A.V. Bodnaruk, M.M. Kulyk, V.M. Kalita, V.O. Zamorskyi, S.M. Ryabchenko, A.G. Belous, *Manganite nanoparticles as promising heat mediators for magnetic hyperthermia: comparison of different chemical substitutions*

L. Frolova, A. Derimova, T. Butyrina, *Structural and Magnetic Properties of Cobalt Ferrite Nanopowders Synthesis Using Contact Non-Equilibrium Plasma*

O. Zaremba, R. Gladyshevskii, *Interaction of the components in the BaO-Tb<sub>2</sub>O<sub>3+δ</sub>-CuO and related systems*

O. Shcherban, L. Akselrud, E. Giannini, R. Gladyshevskii, *Refinement of the modulated structures of Pb-free and Pb-doped Bi-2223 HTSC*

A. Altinkok, M. Olutas, H. Yetis, A. Kiliç and K. Kiliç, *Analysis of observed voltage oscillations in silver doped high temperature superconductor YBCO*

V. Kotsyubynsky, A. Hrubciak, V. Moklyak, L. Mohnatska, S. Fedorchenko, *Synthesis and Properties of Mesoporous Maghemite*

D. Jackiewicz, M. Kachniarz, A. Bieńkowski, *Temperature Influence on The Functional Properties of Inductive Components with Mn-Zn Ferrite Cores*

P. Gazda, M. Nowicki, M. Kachniarz, *Active LR integrator circuit with ferrite core*

P. Nowak, M. Nowicki, K. Gromada, R. Szewczyk, *Utilization of Electromagnetic Tomography for Ferrite Rings Testing*

T. Charubin, P. Nowak, M. Nowicki, R. Szewczyk, M. Urbański, *Automatic measurement station for ferrite materials testing*

J. Salach, P. Nowak, *The Influence of Compressive Stresses on the Properties of Inductive Electronics Components*

M. Kachniarz, A. Bieńkowski, R. Szewczyk, *Magnetoelastic Villari Effect in Ferrite Materials for Force and Stress Sensors Working in Low Magnetizing Field Region*

V.E. Shaternik, A.P. Shapovalov, T.A. Prikhna, O.Yu. Suvorov, M.A. Skorik, A.V. Shaternik, V.I. Bondarchuk, E.E. Zubov, *Structure and transport characteristics of tunnel junctions with hybrid semiconductor barriers with quantum dots*

I. Petryshynets, F. Kováč, L. Falat, V. Puchý, M. Šebek, *Magnetic losses evolution of ferritic Fe-Si Steels Subjected to Temper Rolling at Elevated Temperature*

## Materials for sensing and catalysis

Yu. Suhak, M. Schulz, A. Sotnikov, H. Schmidt, H. Fritze, *Electrical, Electromechanical and Piezoelectric Properties of  $\text{Ca}_3\text{TaGa}_3\text{Si}_2\text{O}_{14}$  Resonators at Elevated Temperatures*

T.L. Rakitskaya, T.A. Kiose, K.O. Golubchik, G.M. Dzhiga, A.A. Ennan, V.Y. Volkova, *Catalytic compositions based on chlorides of d metals and natural aluminosilicates for the low-temperature sulfur dioxide oxidation with air oxygen*

T.L. Rakitskaya, A.S. Truba, A.A. Ennan, V.N. Baumer, V.Y. Volkova, *Synthesis and catalytic properties of iron oxides in the reaction of low-temperature ozone decomposition*

M. Zhudenko, A. Dyachenko, O. Bieda, S. Gaidai, M. Filonenko, O. Ischenko, *Structure and catalytic properties of Co - Fe systems in the reaction of  $\text{CO}_2$  methanation*

R. Meshkini Far, A. Dyachenko, S. Gaidai, O. Bieda, M. Filonenko, O. Ischenko, *Catalytic properties of Ni - Fe systems in the reaction of  $\text{CO}_2$  methanation at atmospheric pressure*

N. Chubar, V. Gerda, M. Mičušík, M. Omastova, K. Heister, P. Man, G. Yablokova, D. Banerjee, J. Fraissard, *Anion removal potential of complex metal oxides estimated from their atomic scale structural properties*

G. Sokolsky, L. Zudina, E. Boldyrev, O. Miroshnikov, N. Gauk, O.Ya. Kiporenko, O. Ya, *ORR electrocatalysis on  $\text{Cr}^{3+}$ ,  $\text{Fe}^{2+}$ ,  $\text{Co}^{2+}$  -doped manganese(IV) oxides*

M.–O.M. Danyliak, L.M. Boichyshyn, N.L. Pandiak, *Hydrogen evolution reaction on the oxidized surfaces of the Fe-based amorphous alloys*

V.B. Mykhaylyk, H. Kraus, A. Wagner, *Non-contact luminescence lifetime micro-thermometry using scintillation sensors*

I. Korobiichuk, O. Bezvesilna, M. Kachniarz, M. Koshovyj, V. Kvasnikov, *Methods and Ways of Piezoelectric Accelerometers Fastening on the Objects of Research*