

## CONTENTS

|  |    |
|--|----|
| <b>General information</b> .....   | 13 |
| Part I   |    |
| FINAL PROGRAMME  |    |
| <b>Final Programme</b> .....   | 16 |
| Part II  |    |
| PLENARY LECTURES   |    |
| <b>Highly conductive barium iron vanadate glass containing different metal oxides</b><br>T. Nishida, Y. Izutsu, M. Fujimura, K. Osouda, Y. Otsuka, S. Kubuki, N. Oka .....   | 26 |
| <b>Solid electrolytes for lithium ion batteries – on the route toward solid state batteries</b><br>J. Janek .....  | 27 |
| <b>Transient nucleation in phase-change chalcogenides: sub-nanosecond data recording</b><br>J. Orava, A. Lindsay Greer .....   | 28 |
| <b>Nanoporous materials in the light of emerging applications</b><br>V. Zeleňák .....  | 29 |
| <b>Cultural Heritage: study of materials used in the Alcazar of Seville (Spain)</b><br>J. L. Perez-Rodriguez .....   | 30 |
| Part III   |    |
| INVITED LECTURES   |    |
| <b>High-temperature Mössbauer effect study of the iron doped <math>\text{La}_{N+1}\text{NiNO}_{3N+1}</math>, (N=1,2,3) system</b><br>P. Gaczyński, T. Klande, E. Kiselev, V. Cherepanov, A. Feldhoff, K.-D. Becker ..... | 32 |
| <b>Microscopic phenomena in Fe-Cr alloys as seen by the Mössbauer spectroscopy</b><br>S. M. Dubiel .....   | 33 |
| <b>Structure and properties of nanocrystalline nickel prepared by selective leaching at different temperatures</b><br>A. Michalcová, I. Marek, A. Lén, O. Heczko, J. Drahokoupil, D. Vojtěch .....                       | 34 |
| <b>Heusler alloy formation on the zirconium surface</b><br>K. Horakova, S. Cichon, J. Lancok, V. Chab, P. Sajdl .....  | 35 |
| <b>Element-specific characterization in spin-orbit-coupled interfaces using X-ray magnetic circular dichroism</b><br>J. Okabayashi .....   | 36 |

|   |    |
|---|----|
| <b>Low cost materials for the catalytic combustion of producer gas</b><br>D. Vidyasagar, J. Subrt, G. Saravanan, S. Rayalu, S. Dasappa, N. Labhassetwar .....   | 37 |
| <b>Titania aerogels with tailored nano and microstructure: comparison of lyophilization and supercritical drying</b><br>J. Šubrt, E. Plišingrová, J. Boháček, M. Klementová, H. Sovová .....  | 38 |
| <b>Visible-light activated photocatalytic effect of ironcontaining aluminosilicate glass prepared from slag</b><br>S. Kubuki, K. Balazs, K. Sunakawa, Z. Homonnay, E. Kuzmann, T. Nishida .....   | 39 |
| <b>Ionic conductive chalcogenide films for nanoscale memories</b><br>T. Wágner, B. Zhang, S. Valkova, M. Fraenkl, M. Krbal, M. Frumar, G. Chen .....  | 40 |
| <b>Origin of silver ions migration in nano-ionic memory studied by atom-probe tomography</b><br>J. Orava, M. Chen, T. Wagner, A. Lindsay Greer .....  | 41 |
| <b>Redistribution of iron among various sites in porous ferrisilicates during redox treatments</b><br>K. Lázár .....  | 42 |
| <b>Notes on the challenge of methods of thermal analysis in solid state chemistry</b><br>M. Drábik, E. Chmielewská, M. Nováková .....   | 43 |
| <b>Synthesis, structure and thermophysical properties of the phosphates <math>M_{0.5+x}M'_xZr_{2-x}(PO_4)_3</math> (<math>M, M'</math> – metals in oxidation state +2)</b><br>E. Asabina, V. Pet'kov, P. Mayorov, V. Shatunov, I. Schelokov, A. Markin, A. Kovalsky ..... | 44 |
| <b>Mechanically induced chemistry of oxides: present state</b><br>V. Šepelák .....  | 45 |
| <b>Mössbauer spectroscopy: unconventional bio- and chemical applications</b><br>A. Lančok .....   | 46 |
| <b>Forty years of the Hrubý glass-forming criterion via DTA figures regarding the vitrification ability and glass stability</b><br>J. Šesták .....  | 47 |

## Part IV

## LECTURES

|   |    |
|---|----|
| <b>Electric quadrupole interaction in cubic BCC iron</b><br>A. Błachowski, K. Komędera, K. Ruebenbauer, G. Cios, J. Żukrowski, R. Górnicki .....  | 50 |
| <b>Growth, characterization and properties of thin film <math>Rh_2Mn(X=Al, Bi)</math> full Heusler Alloys</b><br>S. Cichoň, J. Lančok, J. Kopeček, L. Klimša, P. Fitl, J. Vlček, O. Heczko, J. Drahokoupil, J. Remiášová, V. Cháb ..... | 51 |
| <b><math>SrAl_{12}O_{19}</math> thin films by chemical solution deposition and their use as buffer layers for oriented growth of hexagonal ferrites</b><br>R. Uhrecký, J. Buršík, D. Pulmannová, R. Kužel, V. Holý, M. Dopita .....     | 52 |
| <b>Materials related to the fluorite structure formed between tin(II) fluoride and <math>MF_2</math> or <math>MCl_2</math></b><br>G. Dénès, J. Kochuparampil, M. C. Madamba, H. Merazig, A. Muntasar, Z. Zhu .....                      | 53 |

|   |    |
|---|----|
| <b>Indirect way of reaction for the intercalation of gold into graphite: overview of the graphite-K-Au system</b><br>S. Cahen, M. Fauchard, P. Lagrange, C. Hérold .....  | 54 |
| <b>Enhanced efficiency of sulfur cathode via cryogenic grinding of glassy-like sulfur for application in li-s batteries</b><br>M. Krbal, T. Kazda, M. Pouzar, T. Wagner, A. Strakova Fedorkova, J. Vondrak, J. M. Macak .....   | 55 |
| <b>Structural and photo-physical properties of CH<sub>3</sub>NH<sub>3</sub>PbI<sub>3</sub> perovskite single crystals</b><br>K.W. Sun .....   | 56 |
| <b>First-principles study of Sn-doped V<sub>2</sub>O<sub>5</sub> as cathode material for Li-ion batteries</b><br>S. Suthirakun .....  | 57 |
| <b>Transport and magnetic properties of Bi<sub>2</sub>Te<sub>3</sub> single crystals doped with overstoichiometric transition metal</b><br>P. Cermak, C. Drasar, J. Prokleska, A. Krejcova, T. Cernohorsky .....  | 58 |
| <b>Preparation of TiO<sub>2</sub>/SiO<sub>2</sub> nanocomposite photocatalyst by using volcanic ash as a silica source and its photocatalytic study</b><br>E.T. Wahyuni, S. Suherman .....  | 59 |
| <b>Effect of surface modification of smectite clays by the interaction with organic molecules on their catalytic activity</b><br>G. Rangel-Porras, A. Quiroga-Almaguer, R. Miranda-Aviles, C.D. Moncada-Sánchez, R. Zarraga-Nuñez .....   | 60 |
| <b>Synthesis of layered alpha alumina by heat-treatment of aluminium carbide</b><br>D. Nyblova .....  | 61 |
| <b>Extended di- and tri-ketone derivatives as versatile building blocks for metallo-supramolecular chemistry - from polyrotaxane generation to pressure induced molecular switching</b><br>L. F. Lindoy .....   | 62 |
| <b>Synthesis, crystal structures and spectral, redox and magnetic properties of cobalt(II)/(III) complexes with chelating s-, p-donor ligands</b><br>F. Varga, J. Titiš, C. Rajnák, J. Moncol', R. Boča .....   | 63 |
| <b>Solvothermal synthesis of novel oxothio germanates</b><br>J. D. Lampkin, A.V. Powell, A. M. Chippindale .....  | 64 |
| <b>High temperature Raman spectra of Na<sub>2</sub>B<sub>4</sub>O<sub>7</sub> glasses and glassforming melts - their multivariate curve resolution statistical treatment and interpretation by the Shakhmatkin and Vedishcheva thermodynamic model</b><br>M. Liška, B. Hruška, M. Chromčíková, J. Macháček, T. Gavenda, J. Michálková ..... | 65 |
| <b>Viscosity and crystallization of the chloroantimonite glasses</b><br>F.M. Legouera, M. Iezid, P. Kostka, F. Rahal, D. Yezli, F. Goumeidane, M. Poulain .....   | 66 |
| <b>Photoluminescence in amorphous chalcogenides doped with lanthanide ions</b><br>V. Prokop, T. Wagner, L. Strizik, L. Benes, J. Oswald, B. Frumarova, M. Vlcek, R. Svoboda .....   | 67 |
| <b>Investigation of the resistive switching in Ag<sub>x</sub>AsS<sub>2</sub> layer by conductive AFM</b><br>B. Zhang, P. Kutalek, P. Knotek, L. Hromadko, J. M. Macak, T. Wagner .....  | 68 |

|  |    |
|--|----|
| <b>Chemical and physical origin of chalcogenide glasses micro and nanostructuring</b><br>M. Vlcek, K. Palka, S. Slang, J. Buzek .....  | 69 |
| <b>Optical properties of Er<sup>3+</sup>-doped and Er<sup>3+</sup>/Yb<sup>3+</sup>-co-doped GeGaSbS chalcogenide glasses</b><br>D. Himics, L. Strizik, J. Holubova, L. Benes, J. Oswald, T. Wagner .....   | 70 |
| <b>The application of thermal analysis in the fields of modern solid-state chemistry</b><br>M.Schöneich .....  | 71 |
| <b>A novel solid state route for the preparation of oxygen deficient oxide nanoparticles with simultaneous compounding with carbon nanoparticles</b><br>M. Senna, T. Shirai, M. Fuji, N. Takezawa, N. Suzuki, M. Fabian, E. Turianicova,<br>M. Balaz, P. Balaz, V. Sepelak, P.J. Kumar, N. Sakamoto, H. Suzuki ..... | 72 |
| <b>Structure and electronic property of tellurium containing pyrochlore oxides</b><br>A. Waahayee, T. Lerdwiriyanupap, T.Siritanon .....   | 73 |
| <b>Application of iZTO thin films to organic solar cells</b><br>H. J. Lee, Ch. Y. Koo, Y. G. Lee, H. Y. Lee .....  | 74 |
| <b>M-type ferrites as template layers for the growth of oriented Y-type ferrites through chemical solution deposition</b><br>J. Buršík, R. Uhrecký, D. Pulmannová, M. Slušná, M. Dopita, R. Kužel .....  | 75 |
| <b>Precipitation of thermoelectric phases from Ge-Se-Te-Bi glasses by annealing or sintering</b><br>H. Yin, L. Li, G. Chen .....   | 76 |
| <b>Room-temperature ferromagnetism in mechanosynthesized Ce<sub>1-x</sub>Y<sub>x</sub>O<sub>2-δ</sub> (x≤0.3) solid solutions</b><br>M. Fabián, D. Menzel, M. Kaňuchová, V. Šepelák .....  | 77 |
| <br>Part V<br>POSTERS  |    |
| <b>Kosnarite type ceramic with adjustable and near-zero coefficients of thermal expansion</b><br>V. Pet'kov, E. Asabina, A. Shipilov, A. Dmitrienko .....  | 80 |
| <b>Study of ionic properties of Ag-Ge-Sb-S glasses by electrochemical impedance spectroscopy and radioactive tracer diffusion</b><br>M. Fraenkl, K. Shimakawa, T. Wágner .....   | 81 |
| <b>Structure of V<sub>2</sub>O<sub>5</sub>-ZnO-P<sub>2</sub>O<sub>5</sub> glassy system by raman spectroscopy and electron spin resonance</b><br>P. Hejda, J. Holubová, Z. Černošek, E. Černošková .....   | 82 |
| <b>Thermodynamic model and redox state of model glasses for vitrification of radioactive waste chrompik determined by raman spectroscopy</b><br>B. Hruška, M. Liška, M. Chromčíková, J. Vokelová, M. Teplanová, T. Gavenda .....   | 83 |
| <b>Investigation of barium borophosphate glasses modified with niobium oxide</b><br>P. Kalenda, L. Koudelka, P. Mošner, L. Montagne, B. Revel .....  | 84 |

|   |     |
|---|-----|
| <b>The chemical durability of nukon glass fibers under static and dynamic condition in corrosive media</b>  |     |
| J. Michálková, J. Vokelová, M. Lissová, B. Hruška, M. Chromčíková, M. Liška .....   | 85  |
| <b>Silicon carbide thin films deposited by PECVD technology for harsh environment applications</b>  |     |
| J. Huran, V. Sasinková, A. Kleinová .....   | 86  |
| <b>Effect of cobalt-oxygen vacancies on electric properties of double perovskites <math>\text{EuBaCo}_{2-x}\text{O}_{6-\delta}</math></b>   |     |
| S. Telegin, S. Naumov, O. Reznitskih, E. Patrakov, D. Tsvetkov, A. Zuev .....   | 87  |
| <b>Transport and magnetic properties of double perovskites <math>\text{EuBaCo}_{2-x}\text{O}_{6-\delta}</math></b>  |     |
| S. Telegin, N. Solin, S. Naumov, E. Patrakov, A. Markin, D. Lyakaev .....   | 88  |
| <b>Physico-chemical properties of the <math>\text{Ge}_8\text{Sb}_{2-x}\text{Bi}_x\text{Te}_{11}</math> bulks and thin films</b>   |     |
| V. Karabyn, J. Prikryl, L. Strizik, L. Benes, R. Svoboda, B. Frumarova, T. Wagner, M. Frumar .....  | 89  |
| <b>Structure and properties of <math>\text{Sr}_{1-x}\text{Ln}_x(\text{Fe}, \text{Co})\text{O}_{3-\delta}</math> (Ln = Gd, Sm) solid solutions</b>   |     |
| N. E. Volkova, A.V. Maklakova, L.V. Zubatkina, L.Ya. Gavrilova, V.A. Cherepanov .....   | 90  |
| <b>Synthesis and characterization of the rubidium thiophosphate <math>\text{Rb}_6(\text{PS}_5)(\text{P}_2\text{S}_{10})</math> and the rubidium silver thiophosphates <math>\text{Rb}_2\text{AgPS}_4</math>, <math>\text{RbAg}_5(\text{PS}_4)_2</math> and <math>\text{Rb}_3\text{Ag}_9(\text{PS}_4)_4</math></b> |     |
| F. Alahmari, B. Davaasuren, J. Khanderi, A. Rothenberger .....  | 91  |
| <b>Nickel(II) complexes containig triphenylphosphine and ethylxanthate ligands: crystal structures and magnetic properties</b>  |     |
| D. Lomjanský, J. Titiš, J. Moncol, C. Rajnák, R. Boča .....   | 92  |
| <b>Microscope study of nanocrystallized nanoperm-type metallic glass containing molybdenum</b>  |     |
| A. Lancok, L. Volfova, M. Pavuk .....   | 93  |
| <b>Magnetic relaxation processes in Fe and Co based superparamagnetic nanoparticles</b>   |     |
| A. Zeleňáková, V. Zeleňák .....   | 94  |
| <b>Hot embossing of chalcogenide glass thin films</b>   |     |
| J. Bůžek, S. Schroeter, K. Pálka, M. Vlček .....  | 95  |
| <b>Spectroscopic ellipsometry characterization of spin-coated <math>\text{Ge}_{25}\text{S}_{75}</math> chalcogenide thin films</b>  |     |
| P. Janicek, S. Slang, K. Palka, M. Vlcek .....  | 96  |
| <b>Photoelectrochemical studies of mesoporous ceria promoted by platinum</b>  |     |
| N. R. Manwar, J. Subrt, A. K. Bansiwai, S. S. Rayalu, N. K. Labhsetwar .....  | 97  |
| <b>Thermo-induced changes in <math>\text{As}_{30}\text{S}_{70-x}\text{Se}_x</math> spin-coated thin films</b>   |     |
| K. Palka, L. Prazakova, S. Slang, M. Vlcek .....  | 98  |
| <b>Impedance spectroscopy of solar cell structures a-SiC/c-Si before and after neutron irradiation</b>  |     |
| M. Perný, J. Huran, V. Sasinková, V. Šály, M. Mikolášek, M. Váry .....  | 99  |
| <b>Optical properties and surface structuring of <math>\text{Ge}_{20}\text{Sb}_5\text{S}_{75}</math> amorphous chalcogenide thin films deposited by spin-coating and vacuum thermal evaporation</b>   |     |
| S. Slang, P. Janicek, K. Palka, M. Vlcek .....  | 100 |

|  |     |
|--|-----|
| <b>New high-energy planetary ball mill for large scale mechanochemical synthesis</b><br>P. Billik, T. Turányi .....  | 101 |
| <b>Textural and morphology changes of mesoporous SBA-15 silica during introduction of guest phase</b><br>R. Bulánek, P. Čičmanec .....   | 102 |
| <b>Polymeric tin carbide synthesized by matrix assisted pulsed laser evaporation</b><br>V. Jandová, R. Fajgar, V. Dřínek .....   | 103 |
| <b>Cymantrenecarboxylate complexes of rare earth and transition metals as precursors for manganites</b><br>P. S. Koroteev, A. B. Ilyukhin, N. N. Efimov, A. V. Gavrikov, D. I. Kirdyankin,<br>A. P. Kritskaya, Zh.V. Dobrokhotova, V. M. Novotortsev ..... | 104 |
| <b>Preparation of silicon and germanium thin layers with high manganese content by pulsed laser deposition</b><br>M. Kostejn, R. Fajgar, V. Dřínek .....   | 105 |
| <b>Anion-controlled assemblies of silver(I) coordination polymers and their anion-exchange exhibiting dimensional changes in the solid state</b><br>E. Lee, K.-M. Park, M. Ikeda, S. Kuwahara, Y. Habata, S. S. Lee .....                                  | 106 |
| <b>Syntheses of anisotropically-shaped calcium silicon nitride particles through combined techniques of ultrasonic spray pyrolysis and carbothermal reduction/nitridation</b><br>S. Ono, H. Kuwahara, H. Kuroe, K. Itatani .....                           | 107 |
| <b>Five mononuclear pentacoordinate Co(II) complexes as field-induced single molecule magnets</b><br>C. Rajnák, R. Boča .....  | 108 |
| <b>Toward the control of multi-layer graphene samples: characterization and chemical treatments</b><br>L. Speyer, S. Fontana, S. Cahen, C. Hérold .....  | 109 |
| <b>Microwave synthesis of Al<sub>4</sub>C<sub>3</sub> and Al<sub>2</sub>OC</b><br>E. Šimon .....   | 110 |
| <b>Highly efficient vanadium supported catalyst for production of acetaldehyde from ethanol</b><br>R. Bulánek, J. M. Hidalgo, K. Raabová, D. Kubička .....   | 111 |
| <b>Silicon nanowire with a complex structure</b><br>V. Dřínek, J. Kupčík .....   | 112 |
| <b>Metal-organic frameworks as colorimetric magnetic sensors of biogenic amine vapors</b><br>I. Castro, R. Ruiz-García, N. Moliner, M. L. Calatayud, M. Julve, F. Lloret,<br>N. Marino, G. De Munno .....  | 113 |
| <b>The activity test of Fe<sub>3</sub>O<sub>4</sub>/SiO<sub>2</sub>/TiO<sub>2</sub> core-shell nanocomposite as photocatalyst for silver(I) reduction</b><br>E. S. Kunarti, A. Syoufian, B. Rusdiarso, A. R. Pradipta, I. S. Budi .....                    | 114 |

**Modified 2D-titanium dioxide nanostructures: preparation, characterization and photocatalytic assessment**

E. Pližingrová, M. Klementová, Z. Barbieriková, J. Boháček, P. Bezdička, J. Krýsa, V. Brezová, J. Šubrt .....115

**Preparation, crystal structures, and photocatalytic activities of SrTiO<sub>3</sub>-LaFeO<sub>3</sub> solid solutions**

K. Tezuka, K. Takahashi, M. Wakeshima, Y. Shan, Y. Hinatsu .....116

**Structural relaxation of zirconia containing silicate glasses**

M. Chromčíková, E. Gašpáreková, B. Hruška, M. Liška, J. Michálková .....117

**The crystalline structure of orthorhombic SrRuO<sub>3</sub>: Application of hybrid density functionals**

Š. Masys, V. Jonauskas .....118

Part VI

LIST OF PARTICIPANTS

List of participants .....120

Part VII

AUTHOR INDEX

Author index .....124