

**TRENČIANSKA UNIVERZITA ALEXANDRA DUBČEKA
V TRENČÍNE**

**PODKLADY K ŽIADOSTI O ZAČATIE
INAUGURAČNÉHO KONANIA
V ODBORE HABILITAČNÉHO KONANIA
A INAUGURAČNÉHO KONANIA
ANORGANICKÁ TECHNOLOGIA A MATERIÁLY**

Doc. Ing. Róbert KLEMENT, PhD.

TRENČÍN 2026

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Dates	1993 – 2001
Occupation or position held	Researcher and assistant lecturer at department of Physical Chemistry CHTF STU Bratislava
Main activities and responsibilities	Research in the field of spectroscopy (EPR, UV-VIS-NIR) and electrochemistry of coordination compounds mimicking the metal proteins Solving of research tasks within the framework of solving research grants Publication of research results in journals, presentation of results at conferences Seminars and laboratory seminars (physical chemistry and other subjects) for students
Name and address of employer	Faculty of Chemical Technology, Slovak Technical University, Radlinského 9, SK-812 37 Bratislava
Qualification / Education	
Dates	2018
Title of qualification awarded	Habilitation (Doc./Asoc. Prof.)
Thesis title	"Photoluminescence properties of activators-doped glasses and polycrystalline systems for application in solid state lighting"
Name of organisation awarding the title	University of Alexander Dubček in Trenčín, Študentská 2, SK-911 50 Trenčín
Dates	2008
Title of qualification awarded	Scientific qualification degree IIa (VKS IIa – Independent researcher)
Name of organisation awarding the title	Slovak Academy of Sciences, Bratislava
Dates	2001
Title of qualification awarded	Philosophiae Doctor – PhD. (in physical chemistry)
Thesis title	"Study of the square-planar Cu(II) and Co(II) complexes with derivatives of the Schiff base type ligands Salen and Tetrahydrosalen"
Name of organisation awarding the title	Faculty of Chemical Technology, Slovak Technical University, Bratislava
Dates	1988 – 1993
Title of qualification awarded	Chemical Engineer – Ing. (in physical and analytical chemistry)
Thesis title	"ESR spectroscopy of Cu(II) and Co(II) complexes with Schiff base type ligands"
Name of organisation awarding the title	Faculty of Chemical Technology, Slovak Technical University, Bratislava
Personal skills and competences	
Mother tongue(s)	Slovak
Other language(s)	English (Proficient user – C1 – Understanding/Speaking/Writing)
Social skills and competences	Ability for adaptation on new and/or multicultural environment obtained by working experiences abroad, good communications skills obtained by teaching experiences at university.
Organisational skills and competences	Management of MSc and PhD students, organization of pedagogical and scientific work, management of working group (skills obtained during the work at the university and research institutes abroad), organization and financial management of grants in the field of basic research (skills obtained as principal investigator), organization of the conferences as a member of the organizing committee (skills obtained during organization of 3 international conferences on glass).
Technical skills and competences	Operating of common laboratory equipment in chemistry and/or material laboratory; high-temperature equipment (resistance furnaces); special methods for preparation of polymers (ATRP, ionic polymerization); synthesis of oxide precursor powders (solid state reaction method, Pechini sol-gel method, combustion synthesis); synthesis of porphyrin derivatives; purification of SWNT and their chemical functionalization; operation of EPR spectrometer, UV-VIS-NIR and IR/Raman spectrometer, fluorescence spectrometer (steady state, time resolved – TSCPC); electrochemical workstation PAR 273 and Modulab (electrochemistry in aqueous, non-aqueous solvents, glass melts), impedance spectroscopy; thermal analysis (DTA, DSC); XRD with synchrotron radiation and HT XRD (High Temperature XRD); optical microscopy – skills obtained during working as PhD student at CHTF STU Bratislava, researcher at CHTF STU Bratislava, TrUAD Trenčín or during the stays at TU Darmstadt, ICS Strasbourg, Diamond Synchrotron Light Source Harwell, UK.

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Computer skills and competences	Routine work on PC, OS Windows, MS Office(Word, Excel, Outlook and PowerPoint), Microcalc Origin, routine work with graphical software, other special software: Statistica, Factsage (TD modelling software), ISIS draw, ChemDraw (chemical formulae drawing), Fortran 77 and 90 (Lahey 90, Fortran Power Station), WinEPR, QPOW (software for treating and simulation of EPR spectra), MestreNova, DMFIT (software for treating and simulation of NMR spectra), HighScore, SearchMatch, FullProf Suite (software for treating and simulation of XRD patterns), PeakFit (special fitting and deconvolution software), electrochemical software, fluorescence software (FluorEssence, DAS6) etc. Skills obtained through self-study.
Driving licence	Driving licence group B
Other interests	Sport: swimming, biking, hiking, skiing, jogging. Reading: from classical literature to current affairs. History of England: early and late middle ages, and especially Tudor's England.

Additional information**Teaching Experiences:**

from 1993 to present

General and inorganic chemistry – laboratory practice;

General chemistry – seminars;

Chemical physics (basis of analytical and quantum mechanics) – seminars;

Physical chemistry – lectures, seminars and laboratory practice;

Colloid chemistry and physical chemistry of surfaces – lectures, seminars (for MSc. and PhD students);

Molecular spectroscopy – lectures, laboratory practice in UV-VIS-NIR and fluorescence spectroscopy (for PhD. students);

Chemical engineering I and II – seminars;

Inorganic technology and materials – lectures (for PhD. students)

Supervising of Bc., MSc. and PhD. students: (2 Bc. thesis defended; 6 MSc. thesis defended, 6 PhD. thesis defended; current supervision of 5 PhD. students)

Research Stays:

University of Gent (Department of Inorganic and Physical Chemistry), Ghent, Belgium, 2013 (1 month)

CNRS – Institute Charles Sadron, Strasbourg, France, 2001-2003 (2 years)

Liverpool John Moores University (School of Chemical and Physical Sciences), Liverpool, UK, 1995 (1 month)

Technical University Darmstadt (Department of Inorganic Chemistry), Darmstadt, 1997, 1998 (1 month each year)

Project conducted (as principal investigator):

6 as principal investigator, 15+ as co-investigator.

Projects conducted as principal investigator in last 5 years (2020-2024):

Project title: Long persistent phosphors based on stoichiometric aluminates and silicates for optical and biomedical applications

Grant scheme: VEGA 1/0527/18

Implementation period: 01/2018-12/2021

Budget: 51 072 EUR

Evaluated as excellently solved project.

Project title: Novel glass and glass-ceramic rare-earth aluminates-based phosphors for energy-saving solid state lighting sources emitting white light (pc-WLEDs) – Acronym of the project: WLEDMAT

Grant scheme: APVV 17-0049

Implementation period: 08/2018-12/2022

Budget: 180 045 EUR

Evaluated as excellently solved project.

Project title: Zero-thermal-quenching phosphors for NUV converted pc-WLEDs application

Grant scheme: VEGA 1/0476/22

Implementation period: 01/2022-12/2024

Budget: 43 021 EUR, Evaluated as excellently solved project.

Research interests:

Photoluminescent materials for solid state lighting, scintillators and signature (phosphors/nanophosphors for pc-WLEDs, upconversion phosphors, long lasting phosphors, PiG composites, luminescent transparent ceramics)
 Photoluminescence of materials: glasses, powders, thin films, complexes/supramolecular structures
 Photodynamic therapy
 Spectroscopic and electrochemical techniques relevant in the study glasses and glass melts
 Chemical functionalization of glass surfaces
 Spectroscopy of inorganic materials (UV-VIS-NIR, fluorescence spectroscopy – steady state and time resolved (TCSPC))
 Transition Metal Complexes with ligands having biological relevance (as model systems) studied in the solid state and in solution (fluid and frozen) – spectral techniques (ESR, UV-VIS-NIR, fluorescence)
 Electrochemistry and spectroelectrochemistry in non-aqueous solvents (mainly Cyclic Voltammetry, Square-Wave Voltammetry, UV-VIS-NIR/fluorescence spectroelectrochemistry)

List of publications:

84 publications registered Scopus/WoS; 100+ conference contributions; 2 edited conference proceedings, 5 chapters in books, coauthor of 1 textbook, author of 2 teaching texts; SCI citation: 950+; H-index: 19

Publications (registered SCOPUS/WoS) in last 5 years (2020-2025):

1. S. Sajjadi, M. Žitňan, M.U. Iqbal, M. Machovský, P. Núñez, D. Dvoranová, D. Galusek, R. Klement, J.J. Velázquez: Synergistic effects of Ti3C2 MXene and ZIF-8 for efficient photocatalytic degradation of tetracycline in wastewater, *Journal of Environmental Chemical Engineering* **2025**, 13(5), 118925.
2. H. Ebrahim Hosseini, J. Cao, M. Ghadamyari, D. Galusek, R. Klement, L. Wondraczek: UV/NUV and BW-I Mechanoluminescence from Bi-activated CaY2Ge4O12 polycrystals, *Advanced Optical Materials* **2025**, 13(30), e01673.
3. P. Bekhta, T. Pipiška, J. Ráhel, M. Nociar, B. Mayer, J. Hofman, V. Hamanchuk, R. Klement, P. Král: Particleboards of high-level sugar beet pulp content: structural, mechanical, and chemical comparisons, *Industrial Crops Production* **2025**, 235, 121670.
4. S. Sajjadi, S. Pundir, R. Klement, S. Vičková, P. Baráth, J. Kraxner, A. Mehta: Dual-functional Fe₂O₃-decorated zeolitic catalysts: From persulfate-driven antibiotic degradation to electrochemical oxygen evolution, *Journal of Environmental Chemical Engineering* **2025**, 13(6), 120178.
5. H. Ebrahim Hosseini, J. Cao, M. Ghadamyari, D. Galusek, R. Klement, L. Wondraczek: Mechanoluminescence of Bi-Activated NaYGeO₄ polycrystals and 3D printed scaffolds in the NUV/Blue and NIR spectral range, *Advanced Optical Materials* **2025**, 2500715.
6. G. Galleani, R. Dagupati, B. Wolfrum, R. Klement, J.J. Velazquez, D. Galusek: Stokes and Anti-Stokes emission and biological window III (1.53 μm) luminescence thermometry analysis from Stark sublevels in Er³⁺, Yb³⁺-doped fluorophosphate glasses, *Open Ceramics* **2025**, 22, Art No. 100762.
7. M. Čičkan, R. Klement, M. Matejdes, V. Kureková, D. Furka, S. Furka, K. Tomanová, P. Veteška, M. Janek: Rare earth modification of smectites and their use in luminescent up-conversion emission, *Applied Clay Science* **2025**, 266, 107685.
8. M. Majerová, A. Prnová, J. Valúchová, M. Micháľková, B. Pecušová, M. Žitňan, R. Klement, D. Galusek: Hot press sintering of Y₂O₃-Al₂O₃ glasses: Impact of particle size on thermal behaviour, sintering ability and mechanical properties of sintered bodies, *Helyon* **2025**, 11(1), e41260.
9. P. Višćor, Z. Černošek, K. Faturíková, J. Holubová, R. Klement, M. Liška, L. Tichý: Electrical transport and dielectric relaxation in 5Fe₂O₃-40ZnO-55P₂O₅ iron zinc phosphate bulk glass, *Journal of Non-Crystalline Solids* **2025**, 648, 123311.
10. M. Matejdes, P. Škorňa, M. Slaný, R. Klement, J. Bujdák, J. Kawamata, J. Breu: Excimer formation in a 2D confined space, *Materials Today Chemistry* **2024**, 42, 102436.
11. N.M.P. Truong, M. Micháľková, M. Sedano, M.J. Pascual, R. Klement: Pressure-assisted sintering approaches for up-converting LiYF₄:Er/Yb transparent oxyfluoride glass-ceramics, *Open Ceramics* **2024**, 20, 100713.

12. H.E. Hosseini, J. Cao, Y. Ding, M. Ghadamyari, D. Galusek, R. Klement, L. Wondraczek: Preparation and optical properties of Bi³⁺-doped K₂SrGe₂O₉ as a UVA phosphor, *Optical Materials Express* **2024**, 14(10), pp. 2384-2399.
13. A. Akusevich, B. Pecušová, A. Prnová, J. Valúchová, I. Parchovianská, M. Parchovianský, M. Micháliková, P. Švančárek, R. Klement: Study of thermal behavior and crystallization kinetics of glass microspheres in the Y₂Al₂O₁₂-Al₂O₃ system, *Journal of Thermal Analysis and Calorimetry* **2024**, 149(19), pp. 10999-11012.
14. M. Ghadamyari, R. Klement, H.E. Hosseini, M. Parchovianský, J. Kraxner, D. Galusek, S. Narayanasamy, E. Hack, G. Blugan, M. Micháliková: Preparation and characterization of YAG microspheres doped with Eu²⁺/Eu³⁺ for broad band emission, *Open Ceramics* **2024**, 19, 100654.
15. D. Drdlik, V. Marák, R. Klement, P. Tofel, K. Drdliková, H. Hadraba, Z. Chlup: Basic microstructural, mechanical, electrical and optical characterisation of BaTiAl₂O₁₂ ceramics, *Boletín de la Sociedad Española de Cerámica y Vidrio* **2024**, 63(5), pp. 368-376.
16. K. Drdliková, R. Klement, D. Rychnovský, K. Maca, D. Drdlik: Optical properties of Tb³⁺- and Cr³⁺-doped MgAl₂O₄ ceramics prepared by capsule- and carbon-free hot isostatic pressing, *Journal of the European Ceramic Society* **2024**, 44(9), pp. 5440-5448.
17. M. Janek, M. Čičkan, R. Klement, M. Matejdes, D. Furka, S. Furka, L. Bača, M. Naftaly: Temperature dependent terahertz spectroscopy study of rare earth modified smectites: Probing the structural responses, *Applied Clay Science* **2024**, 255, 107406.
18. A. Pranav Kumar, S. Hima Bindu, K. Naveenkumar, P. Bongurala, P. Venkateswara Rao, R. Klement, D. Galusek, P. Syam Prasad: Exploring the potential of Eu³⁺ ions doped heavy metal oxide containing germanium borate glasses for high efficiency red emitting solid-state lasers, *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy* **2024**, 311, 123940.
19. S. Sajjadi, A. Anand, A.M. Beltrán, D. Dvoranová, A.R. Boccaccini, D. Galusková, D. Jaška, R. Klement: Investigation of catalytic activation of peroxydisulfate on Cu-doped mesoporous silica-based particles (Cu-BMS) for efficient degradation of methylene blue, *Catalysis Communications* **2024**, 186, 106833.
20. R. Dagupati, M. Sedano, R. Klement, J.J. Velázquez, A. Durán, F. Muñoz, M.J. Pascual, D. Galusek: The influence of Al₂O₃ concentration on the NaYF₄ crystallization in oxyfluoride glass-ceramics, *International Journal of Applied Glass Science* **2024**, 15(1), pp. 44-56.
21. N.M.P. Truong, M. Sedano, A. Durán, R. Balda, M.J. Pascual, R. Klement: Er/Yb co-doped LiYF₄ transparent oxyfluoride glass-ceramics with up-conversion optical properties, *Ceramics International* **2023**, 49(24), pp. 41201-41209.
22. K. Griebenow, M.P. Truong, F. Munoz, R. Klement, D. Galusek: Tuning the fluorescence of Dy³⁺ via the structure of borophosphate glasses: *Scientific Reports* **2023**, 13(1), 1919.
23. A. Prnová, J. Valúchová, M. Parchovianský, P. Švančárek, F. Šimko, A. Rakhmatullin, H. Páliková, B. Hruška, R. Klement, D. Galusek: Structure, thermal properties and crystallization behavior of binary Y₂O₃-Al₂O₃ glasses with high alumina content, *Journal of Materials Research and Technology* **2023**, 26, pp. 2333-2351.
24. B. Pecušová, A. Prnová, J. Valúchová, M. Parchovianský, R. Klement, D. Galusek: Crystallization and photoluminescence properties of Er-doped microspheres with ytterbium-aluminium garnet composition, *Ceramics International* **2023**, 49(9), pp. 14895-14903.
25. N. Putenpurayil Govindan, A. Najafzadehkhoe, A. Talimian, V. Pouchlý, M. Micháliková, P. Švančárek, R. Klement, D. Galusek: Sintering of Ce³⁺-doped yttria nanoparticles prepared by precipitation method, *Open Ceramics* **2023**, 13, 100315.
26. R. Klement, K. Drdliková, D. Drdlik, K. Maca: Photoluminescence of rare-earth/transition metal-doped transparent/translucent polycrystalline Al₂O₃ ceramics: A review, *Journal of the American Ceramic Society* **2023**, 106(1), pp. 172-185.
27. P. Boháč, Š. Budzák, V. Planetová, R. Klement, J. Bujdák: Adsorption-Induced Fluorescence of Pseudoisocyanine Monomers in Systems with Layered Silicates, *Journal of Physical Chemistry C* **2022**, 126(40), pp. 17255-17265.
28. K. Drdliková, R. Klement, J. Svoboda, D. Drdlik, D. Galusek, K. Maca: Luminescent Dy³⁺ and Dy³⁺/Cr³⁺ doped transparent Al₂O₃ ceramics: Microstructure and optical properties, *Journal of the European Ceramic Society* **2022**, 42(10), pp. 4343-4352.

29. M. Janek, R. Klement, M. Naftaly, E. Trusova, A. Gatial, P. Veteška, L. Bača: Terahertz response of Er³⁺/Yb³⁺ co-doped La₂Zr₂O₇ synthesized using the sol-gel precipitation method, *Colloids and Surfaces A: Physicochemical and Engineering Aspects* **2022**, 644, 128836.
30. P. Švančárek, R. Klement, W. Wisniewski, M. Parchovianský, D. Galusek: ZnO-doped Y₂O₃ ceramic: A prospective warm white light fluorescent material, *Journal of the European Ceramic Society* **2022**, 42(5), pp. 2478-2486.
31. M. Šuteková, M. Barlog, T. Šimonová Baranyaiová, R. Klement, G.J. Richards, J.P. Hill, J. Labuta, J. Bujdák: Pyrazinacene luminescence enhancement by heat-activated surface adsorption and de-aggregation in a saponite colloidal system, *Applied Clay Science* **2022**, 218, 106413.
32. A. Pranav Kumar, S. Hima Bindu, P. Venkateswara Rao, R. Klement, D. Galusek, N. Veeriah, P. Syam Prasad: Enhancement of rare earth ions hosting potential of B₂O₃ added germanium based glasses: A detailed optical analysis, *Journal of Alloys and Compounds* **2021**, 883, 160800.
33. R. Dagupati, R. Klement, R. Rajavaram, J.J. Velázquez, D. Galusek: In situ synthesis of β-nafuyls: Er³⁺ crystals in oxyfluoride silicate glass for temperature sensors and their spectral conversion and optical thermometry analysis, *Molecules* **2021**, 26(22), 6901.
34. A. Akusevich, I. Parchovianská, M. Parchovianský, A. Pmová, F. Lofaj, M. Vojtko, R. Klement: Glass-ceramic Ce³⁺-doped YAG-Al₂O₃ composites prepared by sintering of glass microspheres, *International Journal of Applied Glass Science* **2021**, 12(4), pp. 497-508.
35. K. Griebenow, F. Muñoz, N.S. Tagiara, R. Klement, A. Pmová, B. Wolfrum, E.I. Kamitsos, A. Duran, D. Galusek: Structure and fluorescence properties of Dy-doped alkaline-earth borophosphate glasses, *International Journal of Applied Glass Science* **2021**, 12(4), pp. 472-484.
36. R. Dagupati, R. Klement, D. Galusek: Er³⁺/Yb³⁺ co-doped oxyfluoro tellurite glasses: Analysis of optical temperature sensing based on up-conversion luminescence, *International Journal of Applied Glass Science* **2021**, 12(4), pp. 462-471.
37. R. Klement, K. Drdlíková, M. Kachlík, D. Drdlík, D. Galusek, K. Maca: Photoluminescence and optical properties of Eu³⁺/Eu²⁺-doped transparent Al₂O₃ ceramics, *Journal of the European Ceramic Society* **2021**, 41(9), pp. 4896-4906.
38. M. Micháľková, J. Kraxner, M. Parchovianský, R. Klement, V. Pouchlý, K. Maca, D. Galusek: Viscous flow spark plasma sintering of glass microspheres with YAG composition and high tendency to crystallization, *Journal of the European Ceramic Society* **2021**, 41(2), pp. 1537-1542.
39. I.Ya. Sulym, P. Veteška, R. Klement, Z. Hajdúchová, J. Lokaj, A. Gatial, M.V. Borysenko, M. Janek, D.V. Gryn, M.S. Iakhnenko, A.P. Naumenko: Structural, optical and luminescence features of Er³⁺/Yb³⁺-co-doped sol-gel silica glasses, *Functional Materials* **2021**, 28(1), pp. 14-21.
40. A. Pmová, A. Pliško, J. Valúchová, R. Klement, M. Chromčíková, N. Mutlu, M. Majerová, E. Bruneel, D. Galusek: Crystallization kinetics of binary Yb₂O₃-Al₂O₃ glass, *Journal of Thermal Analysis and Calorimetry* **2020**, 142(5), pp. 2141-2148.
41. K. Drdlíková, D. Drdlík, H. Hadraba, R. Klement, K. Maca: Optical and mechanical properties of mn-doped transparent alumina and their comparison with selected rare earth and transient metal doped aluminas, *Journal of the European Ceramic Society* **2020**, 40(14), pp. 4894-4900.
42. A. Pmová, J. Valúchová, N. Mutlu, M. Parchovianský, R. Klement, A. Pliško, D. Galusek: Thermal behaviour and photoluminescence properties of Er- and Nd-doped yttrium aluminate glasses, *Journal of Thermal Analysis and Calorimetry* **2020**, 142(1), pp. 129-138.
43. M. Majerová, A. Pmová, A. Pliško, P. Švančárek, J. Valúchová, R. Klement, D. Galusek: Crystallization kinetics of gehlenite glass microspheres, *Journal of Thermal Analysis and Calorimetry* **2020**, 142(2), pp. 1003-1010.
44. K. Drdlíková, R. Klement, D. Drdlík, D. Galusek, K. Maca: Processing and properties of luminescent Cr³⁺ doped transparent alumina ceramics, *Journal of the European Ceramic Society* **2020**, 40(7), pp. 2573-2580.
45. A. Pmová, J. Valúchová, M. Parchovianský, W. Wisniewski, P. Švančárek, R. Klement, L. Hric, E. Bruneel, D. Galusek: Y₂Al₂O₇-α-Al₂O₃ composites with fine-grained microstructure by hot pressing of Al₂O₃-Y₂O₃ glass microspheres, *Journal of the European Ceramic Society* **2020**, 40(3), pp. 852-860.

Edited conference proceedings:

1. M. Liška, D. Galusek, R. Klement, V. Petrušková (editors), *Glass – The Challenge for the 21st Century*, Proceedings of the 9th Conference of the European Society of Glass Science and Technology with the Annual Meeting of the International Commission on Glass, Trenčín, Slovakia,

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22-26 June, Trans Tech Publications, Zurich, Switzerland, 2008, 692 strán. (ISBN 0-87849-387-5, ISBN-13 978-0-87849-387-6)

2. M. Liška, R. Klement (editors), Conference proceedings, Slovak and Czech conference on glass, Trenčianske Teplice, Slovakia, 30. November – 2. December, special issue of the journal Sklár a Keramik, Vol. 61 (2011), Vydavateľstvo Českej sklárskej spoločnosti, Jablonec nad Nisou, Česká republika 2011, 232 pages. (ISBN 978-80-260-1068-5)

Book chapters:

1. R. Klement: Fullerény a Uhlíkové Nanorúrky – Nanomateriál Budúcnosti (Fullerenes and Carbon Nanotubes – A Nanomaterial of the Future), pp. 392-408 In: M. Balog, M. Tatarko a kol.: Odhalené tajomstvá chémie (The secrets of chemistry revealed), VEDA, Vydavateľstvo SAV, Bratislava, 2007. (ISBN 978-80-224-0957-5).
2. R. Klement: Fullerény a Uhlíkové Nanorúrky – Nanomateriál Budúcnosti (Fullerenes and Carbon Nanotubes – A Nanomaterial of the Future), pp. 392-408 In: M. Balog, M. Tatarko a kol.: Odhalené tajomstvá chémie (The secrets of chemistry revealed), 2nd Edition (revised), VEDA, Vydavateľstvo SAV, Bratislava, 2018. (ISBN 978-80-224-1681-8).
3. R. Klement: Fullerény a Uhlíkové Nanorúrky – Nanomateriál Budúcnosti (Fullerenes and Carbon Nanotubes – A Nanomaterial of the Future), pp. 392-408 In: M. Balog, M. Tatarko a kol.: Odhalené tajomstvá chémie (The secrets of chemistry revealed), 3rd Edition (revised), VEDA, Vydavateľstvo SAV, Bratislava, 2024. (ISBN 978-80-224-2067-9).
4. D. Galusek, J. Sedláček, R. Klement, P. Švančárek: Silicon carbide - containing alumina nanocomposites: Processing and properties, Chapter 4, pp. 43-78 In: Advances in Ceramic Matrix Composites, Ed. by I.M. Low, Woodhead Publishing Limited, 2014. (ISBN 978-0-85709-120-8).
5. R. Klement, P. Švančárek, M. Parchovianský, J. Sedláček, D. Galusek: Al₂O₃-SiC nanocomposites: Preparation, microstructure, and properties, Chapter 4, pp. 49-92 In: Advances in Ceramic Matrix Composites, 2nd Edition, Ed. by I.M. Low, Woodhead Publishing Limited, 2018. (ISBN 978-0-08-102166-8).
6. R. Klement, P. Švančárek, M. Parchovianský, J. Sedláček, D. Galusek: Al₂O₃-SiC nanocomposites: preparation, microstructure, and properties, Chapter 4, s. 51 – 95, In: Advances in ceramic matrix composites: Book Series: Woodhead Publishing Series in Composites Science and Engineering, 3rd edition, Ed. by I.M. Low, S. Li, C. Hu, Woodhead Publishing Limited, Elsevier, London, 2025. (ISBN 978-0-443-18598-4).

Textbook:

1. Peter Šimon et al., Laboratórne Cvičenia z Fyzikálnej Chémie (Laboratory practice in physical chemistry) Edícia vysokoškolských učebníc (Edition of university textbooks), Slovenská Technická Univerzita v Bratislave, Vydavateľstvo STU Press, Bratislava 1998, 170 pages. (ISBN 80-227-1113-6) (R. Klement, co-author, 1AH)
2. Robert Klement., Calculation in Chemistry, Part1: Material Balance, Alexander Dubček University of Trenčín (TnUAD), FunGlass TnUAD, Trenčín 2026, 85 pages. (ISBN 978-80-8295-067-3) (R.Klement, author, 4 AH)
3. Robert Klement., Calculation in Chemistry, Part2: Acid-Base Equilibria, Complex Ion Formation Equilibria, Solubility Equilibria, Redox Equilibria, Alexander Dubček University of Trenčín (TnUAD), FunGlass TnUAD, Trenčín 2026, 192 pages. (ISBN 978-80-8295-068-0) (R.Klement, author, 9 AH)

Other information:

Membership in professional organizations:

Slovak Glass Society (2004-2014, member); board member (2005-2012)
Slovak Silicate Society (2017-present, member)
European Ceramic Society (2017-present, member)

Conference organizing committee member:

Norbert Kreidl Memorial Conference, 23.-26.6.2004, Trenčín (international)
8th ESG Conference, 22.-26.6.2008, Trenčín (international)
Slovak and Czech Conference on Glass, 30.11.-2.12.2011, Trenčianske Teplice (international)
14th International Conference on Solid State Chemistry (SSC 2021), 14.-17.6.2021, Trenčín (international)

International and national cooperation:

CEITEC Brno (Prof. Dr. Karel Maca; Dr. Katarína Drdliková; Dr. Daniel Drdlik)

Robert KLEMENT

Otto Schott Institute Jena (Prof. Dr. Lothar Wondraczek)
BAM Berlin (Prof. Dr. Andréa Simone Stocchi de Camargo)
Clemson University USA (Prof. Dr. Luiz Gustavo Jacobsohn)
CSIC Madrid (Prof. Dr. Alicia Durán; Dr. María Jesus Pascual)

UACH SAV (Doc. Ing. Zoltán Lenčes, PhD.; Prof. RNDr. Juraj Bujdák, DrSc.)
FCHPT STU Bratislava (Prof. Ing. Marián Valko, DrSc.; Prof. RNDr. Milan Mazúr, DrSc.; Prof. Ing. Marián Janek, PhD., Doc. Ing. Dana Dvoranová, PhD.)

Awards:

Award of the Deputy Prime Minister and Minister of Education of the Slovak Republic for Science and Technology in the category of Scientific and Research Team of the Year 2008; team member.

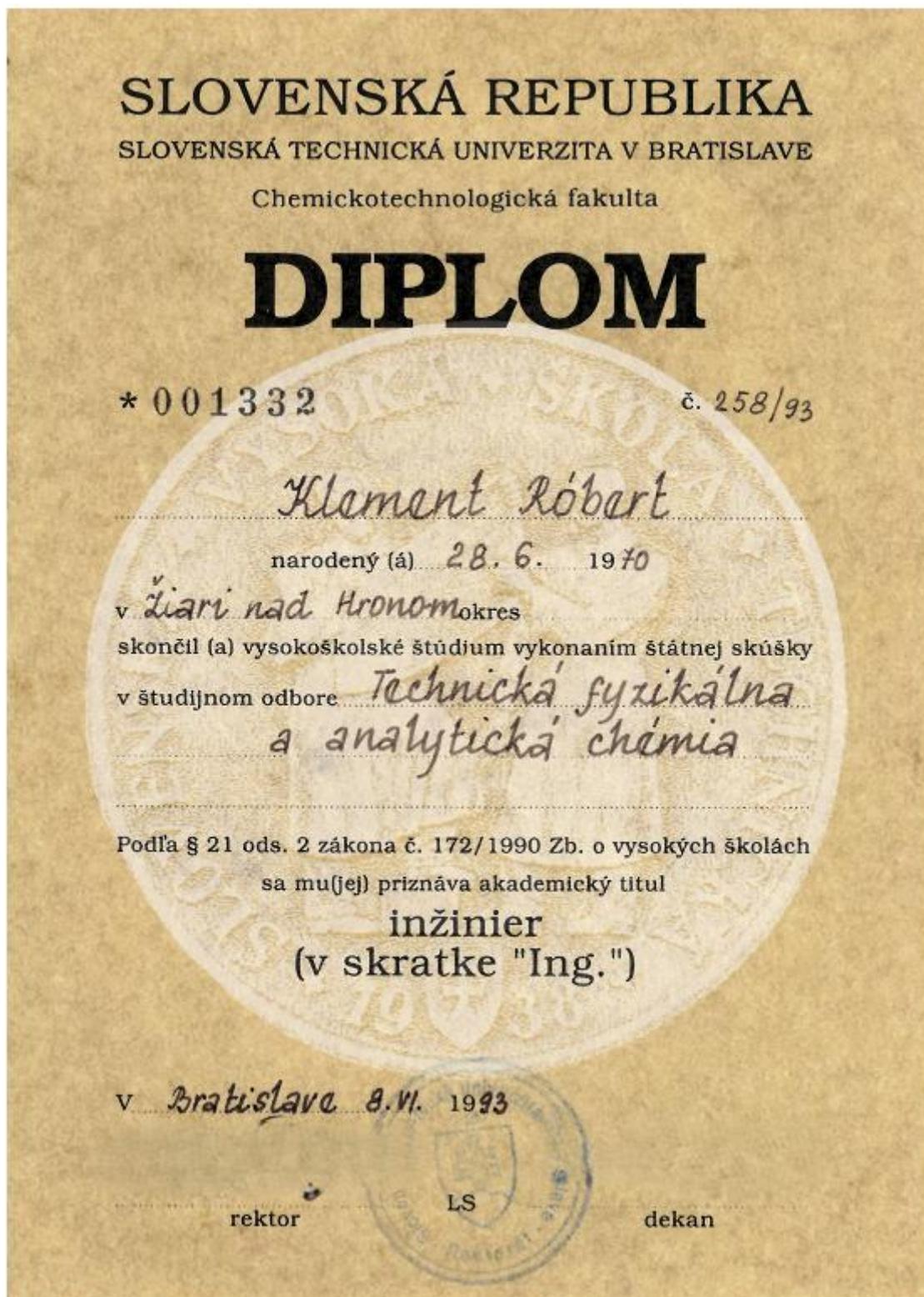
Award of the Minister of Education of the Slovak Republic for Science and Technology in the category Scientific and Research Team of the Year 2019; team member.

Trenčín, 4th March 2026

.....
Robert Klement (signature)

Miesto	Dátum	Meno, priezvisko, titul (podpis)
V Trenčíne	7.3.2026	Doc. Ing. Robert Klement, PhD.

Doklady o vysokoškolskom vzdelaní II. stupňa



SLOVENSKÁ REPUBLIKA

Vysoká škola Slovenská technická univerzita
Číslo 4/93 210
Príloha diplomu č.

Fakulta
Chemickotechnologická

OSVEDČENIE
o štátnej skúške

Róbert K L E M E N T
.....
(meno a priezvisko)

narodený(á) 28. júna 19. 70. v Žiarí n/Hr., okres Žiar n/H.
skončil(a) podľa § 19 zákona č. 172/1990 Zb. o vysokých školách na Chemickotechno-
logickú fakultu Slovenskej technickej univerzity v Bratislave

vysokoškolské štúdium (s vyznamenaním) v študijnom odbore Technická fyzikálna a
analytická chémia, zameranie: Technická fyzikálna chémia

Vykonal(a) štátnu skúšku

1. z chemickej kinetiky 8.6. 19. 93. s prospechom výborne
2. z chemickej termodynamiky 8.6. 19. 93. s prospechom výborne
atomovej a molekulovej 8.6. 19. 93. s prospechom výborne
3. z spektroskopie 8.6. 19. 93. s prospechom výborne
4. z 19. s prospechom
5. z 19. s prospechom

a obhájil(a) diplomovú prácu na tému Štruktúra a elektrónové vlastnosti
komplexných zlúčenín Cu(II) a Co(II) s derivátmi "SALÉNU" a
"TETRAHYDROSALÉNU" 8.6. 19. 93. s prospechom výborne

Celkový výsledok štátnej skúšky

v ý b o r n e

v Bratislave dňa 8.6. 19.93 Prof. Ing. Peter Pelikán, DrSc
dekan



Doklad o vysokoškolskom vzdelaní III. stupňa

SLOVENSKÁ REPUBLIKA
SLOVENSKÁ TECHNICKÁ UNIVERZITA
V BRATISLAVE

DIPLOM

* 000399 z. 120/2001



Ing. Róbert Klement

narodený (d) *28. júna* 19 *70*

v *Ziari nad Hronom*

ukončil (a) doktorandské štúdium vo vednom odbore
14-04-9 fyzikálna chémia

vykonaním dizertačnej skúšky a obhajobou dizertačnej práce na tému
*Štúdium štvorcovo-planárnych komplexných zlúčenín Cu(II) a Co(II)
s derivátmi ligandov typu Schiffových bdx Salen a Tetrahydro-salen*
na *Chemickotechnologickej fakulte STU*

a priznáva sa mu (jej) vedecko-akademická hodnosť
„philosophiae doctor“
(skratka „PhD.“)

v *Bratislave* dňa *6. 3. 2001*

..... rektor dekan



Doklad o priznaní vedeckého kvalifikačného stupňa IIa (VKS IIa)



Ad ačty.

SLOVENSKÁ AKADEMIA VIED
PREDSIEDNÍCTVO

Bratislava 28. 11. 2007
Č.j.: 2957/2007

Komisia SAV pre posudzovanie vedeckej kvalifikácie pracovníkov na svojom 72. zasadnutí dňa 28. 11. 2007 prerokovala Váš návrh na priznanie vedeckého kvalifikačného stupňa podľa § 6 vyhlášky ČSAV č. 55/1977 Zb. a **rozhodla**

Ing. Róbertovi Klementovi, PhD.

priznať stupeň II a - samostatný vedecký pracovník.

Prof. Ing. Tomáš Bleha, DrSc.
predseda komisie

Vážený pán
Prof. Ing. Ján Garaj, DrSc.
riaditeľ
Ústav prírodných a humanitných vied
Trenčianska univerzita A. Dubčeka
Študentská 2
911 50 Trenčín



Na vedomie:

Rektorát Trenčianskej univerzity A. Dubčeka
Ministerstvo školstva SR

Štefánikova 49, 814 38 Bratislava, tel.: 02/57510111, fax: 02/57510608

Dekrét o udelení titulu docent



Písomné referencie od popredných zahraničných odborníkov z 3 rozličných štátov mimo SR

Prof. Dr. Karel Maca – Česká Republika



Rektor
Trenčinská Univerzita Alexandra Dubčeka v Trenčíně
Študentská 2
911 50 Trenčín
Slovensko

V Brně 20.1.2026

Doporučující dopis pro doc. Ing. Róberta Klementa, PhD.

Vážený pane rektore Habániku,

pan doc. Róbert Klement mě požádal, abych napsal tento doporučující dopis na podporu jeho žádosti o pozici profesora na Trenčinské Univerzitě Alexandra Dubčeka v Trenčíně (TnUAD), a já tak rád činím.

Doc. Klementa jsem poznal v rámci své dlouholeté spolupráce s centrem FunGlass na TnUAD a vzhledem k tomu, že naše specializace jsou velmi komplementární, brzy jsme spolu začali i publikovat. Specializace méjí výzkumné skupiny v přípravě pokročilých transparentních luminiscentních keramických materiálů byla vhodně doplněna jeho fundovaným měřením a interpretací optických vlastností, a i díky této multidisciplinarity dosáhlo našich 10 společných publikací 178 citací bez samocitací, což je vysoký nadprůměr citovanosti v oboru keramické vědy. Doc. Klement má sám 85 publikací na WoS, které mají 1 083 citací bez samocitací a jeho h-index je 20 podle WoS. Róberta Klementa jsem viděl přednášet na několika významných konferencích, kde jsem poznal, jak vysoce je jeho práce oceňována v komunitě optické keramiky. Víím také, že byl a je řešitelem národních projektů typu APVV a VEGA.

Vzhledem k tomu, že jsme v rámci našeho společného HE projektu GlaCerHub zakládali cotutelle studium mezi VUT v Brně a TnUAD, poznal jsem, jak aktivní a úspěšný je doc. Klement ve vedení PhD. studentů a také v organizaci PhD. studia v rámci centra FunGlass, kde zastává pozici zástupce ředitele pro pedagogiku.

S potěšením potvrzuji, že vzhledem k jeho reputaci, vědecké a publikační činnosti a pedagogickým aktivitám není pochyb o tom, že doc. Róbert Klement splňuje požadavky na pozici profesora v mezinárodním kontextu.

S pozdravem

Prof. RNDr. Karel Maca, Dr.

Vedoucí výzkumné skupiny Pokročilé multifunkční keramiky
CEITEC VUT
VUT v Brně

CEITEC – Středoevropský technologický institut
Vysoké učení technické v Brně
Purkyňova 123, 612 00 Brno, Česká republika
www.ceitec.cz



Prof. Dr. Alicia Durán – Španielsko



Madrid, 10 February 2026

Alicia Durán, Research professor of CSIC at the Instituto de Cerámica y Vidrio and leader of GlaSS group, nominated as Excellence Research group of CSIC (first 10% among the 1650 research groups of CSIC)

DECLARES

I was asked to express my opinion and recommendation regarding the candidate, Dr. Robert Klement, for a professorship position at the University of Alexander Dubček in Trenčín (TnUAD).

I knew Robert Klement in 2015, when we began to work in the FUNGLASS project, designing a new centre of excellence from Vitrum Laugaricio (VILA) original centre in Trenčín, where he was Senior researcher. He began with the organisation of the Functional Materials Department of FUNGLASS and we collaborated on several research projects. Through this collaboration, I have closely perceived his scientific competence, research independence, and academic leadership on research in the field of photoluminescent and functional materials. Specifically, he focused on research and development in the field of material chemistry, with special focus on advanced inorganic non-metallic materials, mainly glasses, oxide ceramics and composite materials. Application of physico-chemical methods (spectral, electrochemical and spectra-electrochemical) to obtain glass and ceramic materials, photo-luminescent materials and other materials (thin films).

We also worked in close collaboration in Education and Training topics from his position of FUNGLASS Deputy Director for Education and Training. He managed the coordination of education and training activities for PhD study. In particular, the double degree PhD agreements with different universities, including Padova, Erlangen and Jena and Universidad Autonoma de Madrid (UAM) in Spain. It has been a successful task with more than 15 PhD student students getting the double Doctor degree with excellence universities. In particular, we collaborated in the double doctoral degree between the University Autonoma de Madrid (UAM) and the Alexander Dubček in Trenčín (TnUAD) with 4 PhD just defended and 3 more in course.

Dr. Robert Klement has established a strong and internationally visible research profile, evidenced by high-quality publications and active participation in competitive research projects. In addition to his research achievements, he has supervised PhD students and contributed to academic service. He is also an effective lecturer, capable of delivering advanced courses in Physical chemistry of materials, General and inorganic chemistry; General chemistry and Chemical physics; Colloid chemistry and physical chemistry of surfaces; Molecular spectroscopy and UV-VIS-NIR and fluorescence spectroscopy; Chemical engineering, etc.

Based on his scientific accomplishments and academic profile, I am confident that Dr. Robert Klement is well qualified for a professorship of international standing. Based on the facts mentioned above, it is my honour and privilege to recommend Dr. Robert Klement for the position of full professor at the Alexander Dubček University of Trenčín. I strongly endorse his application.

Respectfully Submitted,

Alicia Durán
 Research Professor CSIC
 Chair of the IYOG2022
 Chair of the research group GlaSS
 Instituto de Cerámica y Vidrio, c/Kelsen 5, Campus de Cantoblanco
 28049 Madrid, SPAIN. Email: aduran@icv.csic.es

**DURAN
 CARRERA
 ALICIA
 AMPARO -
 50825138Z**

Firmado digitalmente por
 DURAN CARRERA ALICIA
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 Z, givenName=ALICIA
 AMPARO, sn=DURAN CARRERA,
 cn=DURAN CARRERA ALICIA
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DIPARTIMENTO DI INGEGNERIA INDUSTRIALE

Prof. Enrico Bernardo
Advanced Ceramics and
Glasses group
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35131 Padova

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CF 80006480281
P.IVA 00742430283

Padova, 20/01/2026

To Whom It May Concern,

I am writing with great pleasure to offer my strongest recommendation for Dr. R. Klement in support of his application for a professorial position in the field of Materials Science and Engineering. I have known Dr. Klement for over a decade, since my involvement in the European Project FunGlass ("FunGlass – Centre for Functional and Surface Functionalized Glass" - H2020-WIDESPREAD-01-2016-2017-TeamingPhase2; Topic WIDESPREAD-01-2016-2017 Teaming Phase 2, project number 739566), which included activities performed and supervised by Dr. Klement.

The FunGlass project supported studies at the FunGlass centre of the Alexander Dubcek University of Trencin (Slovakia) in cooperation with several partner institutions. Dr. Klement served as Head of the FunGlass Department of Functional Materials, which operated mainly in cooperation with Consejo Superior de Investigaciones Cientificas (CSIC, Madrid; represented by Prof. Alicia Duran) and Friedrich Schiller University of Jena (represented by Prof. Lothar Wondraczek). Although not formally included in this partnership, I was continuously informed about the progress of the activities through frequent meetings and networking events. I can attest to Dr. Klement's extensive competence in a wide range of optical materials.

I personally coordinated collaborative investigations with FunGlass in various topics, including repurposing of waste glass in new sustainable construction materials, polymer-derived ceramics, and additive manufacturing of glass and glass-ceramics, which led me to interact with other FunGlass Departments. However, I would never exclude future cooperation, recalling our initial collaboration that served as a contact point between our Institutes, prior to the implementation of FunGlass. This collaboration resulted in the paper 'Gehlenite:Eu³⁺ phosphors from a silicone resin and nano-sized fillers', by E. Bernardo et al. in *Optical Materials* 36 (2014) 1243-9, which focused on polymer-derived luminescent materials.

The cooperation between FunGlass and partner institutions was further substantiated by numerous cotutelle agreements for PhD students recruited at the Alexander Dubcek University of Trencin, who had (and still have) secondments at the partners' laboratories. Since 2019, I have had the pleasure of interacting with Dr. Klement in his role as Deputy Director for Education and Training at FunGlass, particularly regarding

co-tutelle agreements involving PhD students hosted by the University of Padova. The establishment of such agreements is challenging, considering the different rules operating in various countries, and requires excellent managerial abilities.

Despite his managerial duties, Dr. Klement's research has not been compromised. His work spans complex topics, beyond the above-mentioned photoluminescence of glasses and glass-ceramics, such as chemical functionalization of glass surfaces, development of Transition Metal Complexes with ligands having biological relevance, photodynamic therapy, spectroscopic and electrochemical techniques relevant in the study of glasses and glass melts, spectroscopy of inorganic materials, electrochemistry and spectro-electrochemistry in non-aqueous solvents.

Dr. Klement's ability to secure adequate funding for these studies demonstrates his intellectual prowess, impressive maturity, and independence. I am confident that Dr. Klement would be an invaluable asset to any academic institution. He possesses a profound understanding of scientific principles, coupled with ethical conduct, proactivity, and genuine dedication to furthering the discipline of Inorganic Technology and Materials. His exceptional research skills, managerial abilities, and collaborative spirit make him an ideal candidate for a faculty position. I wholeheartedly and without reservation support his application.

Please feel free to contact me if you require any further information or clarification regarding Dr. Klement's qualifications and achievements.

Yours sincerely,

Prof. Enrico Bernardo, PhD
Università degli Studi di Padova
Dipartimento di Ingegneria Industriale
Edificio Ex Fisica Tecnica
Via Marzolo, 9
35131 Padova, Italy
phone +39 049 8275510
e-mail enrico.bernardo@unipd.it

II. PEDAGOGICKÁ AKTIVITA

Žiadateľ o inauguračné konanie má viac ako 25-ročnú vysokoškolskú pedagogickú prax nadobudnutú počas pôsobenia na katedre fyzikálnej chémie FCHPT STU Bratislava a na TnUAD Trenčín.

Prehľad pedagogickej činnosti na vysokej škole:

- Všeobecná a anorganická chémia – laboratórne cvičenia (CHTF STU Bratislava)
- Všeobecná chémia – semináre (MtF STU Trnava)
- Výpočtová technika – semináre (CHTF STU Bratislava)
- Chemická fyzika (základy analytickej a kvantovej mechaniky) – semináre (CHTF STU Bratislava)
- Fyzikálna chémia – laboratórne cvičenia (CHTF STU Bratislava)
- Koloidná chémia a fyzikálna chémia povrchov – prednášky, semináre (FPT TnUAD Púchov)
- Chemické inžinierstvo I a II – semináre (FPT TnUAD Púchov)
- Fyzikálna chémia – prednášky, semináre (MtF STU Trnava)
- Anorganická technológia a materiály – prednášky III.st. (PhD., doktorandi) VŠ štúdia (VILA TnUAD Trenčín)
- Molekulová spektroskopia – prednášky III.st. (PhD., doktorandi) VŠ štúdia (VILA, FunGlass TnUAD Trenčín)
- Koloidná chémia a fyzikálna chémia povrchov – prednášky III.st. (PhD., doktorandi) VŠ štúdia (VILA, FunGlass TnUAD Trenčín)
- Koloidná chémia a fyzikálna chémia povrchov – prednášky II.st. (Ing.) VŠ štúdia (VILA TnUAD Trenčín)

Akademický rok	Semester	Predmet	Typ výuky	VŠ
1993/1994	ZS	Všeobecná a anorganická chémia	LC	FCHPT STU
	LS	Výpočtová technika	C	FCHPT STU
1994/1995	ZS	Fyzikálna chémia I.	LC	FCHPT STU
	LS	Fyzikálna chémia II.	LC	FCHPT STU
1995/1996	ZS	Všeobecná chémia	C	MtF STU
	LS	Chemická fyzika I.	C	FCHPT STU
1996/1997	ZS	Všeobecná chémia	C	MtF STU
	LS	Fyzikálna chémia II.	LC	FCHPT STU
1997/1998	ZS	Fyzikálna chémia I.	LC	FCHPT STU
	LS	Fyzikálna chémia II.	LC	FCHPT STU
1998/1999	ZS	Fyzikálna chémia I.	LC	FCHPT STU
	LS	Fyzikálna chémia II.	LC	FCHPT STU

1999/2000	ZS			\$
	LS			\$
2000/2001	ZS	Fyzikálna chémia I.	LC	FCHPT STU
	LS	Fyzikálna chémia II.		FCHPT STU
2001/2002	ZS			&
	LS			&
2002/2003	ZS			&
	LS	Fyzikálna chémia II.	LC	FCHPT STU
2003/2004	ZS	Koloidná chémia	P, C	FPT TnUAD
	LS			
2004/2005	ZS	Koloidná chémia	P, C	FPT TnUAD
	LS			
2005/2006	ZS	Chemické inžinierstvo I.	C	FPT TnUAD
	LS	Chemické inžinierstvo II.	C	FPT TnUAD
	LS	Fyzikálna chémia	P, C	MtF STU
2006/2007	ZS	Chemické inžinierstvo I.	C	FPT TnUAD
	LS	Chemické inžinierstvo II.	C	FPT TnUAD
	LS	Fyzikálna chémia	P, C	MtF STU
2008/2009	ZS	Technická chémia	C	FŠT TnUAD
	LS			
2009/2010	ZS			
	LS	Anorganická technológia a materiály	P	TnUAD
2010/2011	LS	Anorganická technológia a materiály	P	TnUAD
2013/2014	LS	Molekulová spektroskopia	P	TnUAD
2014/2015	LS	Molekulová spektroskopia	P	TnUAD
	LS	Koloidná chémia II. st. VŠ	P	TnUAD
2015/2016	LS	Molekulová spektroskopia	P	TnUAD
doteraz	LS	Koloidná chémia III. st. VŠ	P	TnUAD
2016/2017	LS	Molekulová spektroskopia	P	TnUAD
	LS	Koloidná chémia III. st. VŠ	P	TnUAD
2017/2018	LS	Molekulová spektroskopia	P	TnUAD
	LS	Koloidná chémia III. st. VŠ	P	TnUAD

2018/2019	LS	Molekulová spektroskopia	P	TnUAD
	LS	Koloidná chémia III. st. VŠ	P	TnUAD
2019/2020	LS	Molekulová spektroskopia	P	TnUAD
	LS	Koloidná chémia III. st. VŠ	P	TnUAD
2020/2021	LS	Molekulová spektroskopia	P	TnUAD
2021/2022	LS	Teoretické základy molekulovej spektroskopie	P	TnUAD
2022/2023	LS	Teoretické základy molekulovej spektroskopie	P	TnUAD
2023/2024	LS	Teoretické základy molekulovej spektroskopie	P	TnUAD
2024/2025	LS	Teoretické základy molekulovej spektroskopie	P	TnUAD

P – prednáška; **C** – cvičenie; **LC** – laboratórne cvičenie.

FCHPT STU – Fakulta chemických a potravinárskych technológií STU Bratislava

FPT TnUAD – Fakulta priemyselných technológií TnUAD Púchov

MtF STU – Materiálovo-technologická fakulta STU Trnava

FŠT TnUAD – Fakulta špeckálnej techniky TnUAD Trenčín

TnUAD Trenčianska univerzita Alexandra Dubčeka v Trenčíne

§ – základná vojenská služba

& – študijný pobyt Francúzsko

Vedenie bakalárskych prác:

1. Ján Tarábek (ChTF STU Bratislava, **1997**): Komplexné zlúčeniny Co(II) ako modelové systémy pre proteíny transferujúce a uskladňujúce dikyslík (O₂) – hemoglobín, myoglobín. Školiteľ: Robert Klement
2. Peter Slíva (FPT TnUAD Púchov, **2016**): Príprava a luminiscenčné vlastnosti Ce³⁺ dopovaného Y₂SiO₅ – 54 s. Školiteľ: Robert Klement

Vedenie diplomových prác:

1. Michal Karáčoň (FPT TnUAD Púchov, **2006**): Využitie impedančnej spektroskopie pri štúdiu skiel a keramických materiálov – 64 s. Školiteľ: Robert Klement
Ocenenie: 2. miesto – cena Slovenskej Sklárskej Spoločnosti.
2. Michal Nad' (FPT TnUAD Púchov, **2007**): Fyzikálne vlastnosti a stabilita peny boritanokremičitanových tavenín – 78 s. Školiteľ: Robert Klement
3. Branislav Hruška (FPT TnUAD Púchov, **2009**): Štúdium vlastností boritano-hlinitano-kremičitanových skiel, so zložením blízokým E-sklú, dopovaných Fe₂O₃ – 86 s. Školiteľ: Robert Klement
4. Samuel Fujak (FPT TnUAD Púchov, **2011**): Štúdium redoxných rovnováh polyvalentných prvkov v priemyselne vyrábaných kremičitanových sklách a sklotvorných taveninách – 64 s. Školiteľ: Robert Klement

5. Katarína Haladejová (FPT TnUAD Púchov, **2012**): Príprava a štúdium vlastností hlinitanových skiel v sústave $RE_2O_3-Al_2O_3$, dopovaných vybranými luminiscenčne aktívnymi iónmi prvkov vzácnych zemín – 75 s. Školiteľ: Robert Klement
6. Radovan Húserka (VILA TnUAD Trenčín, **2017**): Príprava a štúdium spektrálnych vlastností Eu^{3+} a Eu^{2+} dopovanej sústavy $Y_2O_3-Al_2O_3$ – 85 s. Školiteľ: Robert Klement

Vedenie doktorandských prác:

1. Ing. Branislav Hruška (VILA TnUAD Trenčín, **2013**): Štruktúra a spektrálne vlastnosti sklokeramických materiálov na báze binárnych a ternárnych aluminátov prvkov vzácnych zemín – 135 s. Školiteľ: Robert Klement. Obhájené: 08/2013.
2. Ing. Petra Gaalová (VILA TnUAD Trenčín, **2015**): Korózia prírodných a syntetických biomateriálov v kyslých médiách a jej vplyv na mechanické vlastnosti – 125 s. Školiteľ: Robert Klement. Obhájené: 08/2015.
3. Ing. Katarína Haladejová (VILA TnUAD Trenčín, **2016**): Nové sklené a sklokeramické luminiscenčné materiály na báze hlinitanov vzácnych zemín pre aplikácie v LED diódach vyžarujúcich biele svetlo – 153 s. Školiteľ: Robert Klement. Obhájené: 08/2016.
4. MSc. Nguyen Mai Phuong Truong (FunGlass TnUAD Trenčín, **2024**): Luminescence application via photon-conversion in rare-earth-doped glass and glass-ceramics – 151 s. Školiteľ: Robert Klement. Obhájené: 12/2024.
5. Ing. Alena Akusevich (FunGlass Trenčín, **2025**): Crystallization behaviour and luminescent properties of undoped and Ce^{3+} -doped glass microspheres in the System YAG- Al_2O_3 – 163 s. Školiteľ: Robert Klement. Obhájené: 08/2025.
6. MSc. Hossein Ebrahim Hosseini Tazeh Kandi (FunGlass TnUAD Trenčín, **2025**): Mechanoluminescence and persistent luminescence of Bi-doped germanates – 205 s. Školiteľ: Robert Klement. Obhájené: 01/2026.

Vedenie študentských projektov (ŠVOČ):

1. René Fáber a Ján Minár (študentský projekt ŠVOČ – 1995, ChTF STU Bratislava): ESR štúdium komplexov $Co(II)$ s derivátmi ligandov typu Salen.
Ocenenie: 1. miesto v sekcii Fyzikálna a Analytická Chémia fakultného kola ŠVOČ (ChTF STU Bratislava).
2. Ján Minár (študentský projekt ŠVOČ – 1996, ChTF STU Bratislava): Teplom indukovaná zmena štruktúry v $(NH_4)_2[Zn(NH_3)_2(CrO_4)_2]$ študovaná metódou ESR spektroskopie.
Ocenenie: 3. miesto v sekcii Fyzikálna a Analytická Chémia fakultného kola ŠVOČ (ChTF STU Bratislava).
3. René Fáber (študentský projekt ŠVOČ – 1996, ChTF STU Bratislava): ESR štúdium komplexných zlúčenín $Co(II)$ s derivátmi ligandov typu Salen a

Tetrahydrosalen (vplyv donorovej sily axiálne koordinovanej bázy na tvorbu dikyslíkových aduktov).

Ocenenie: 1. miesto v sekcii Fyzikálna a Analytická Chémia fakultného kola ŠVOČ (ChTF STU Bratislava).

Tvorba študijných materiálov a učebných textov:

1. Peter Šimon a kolektív (**R. Klement**), Laboratórne Cvičenia z Fyzikálnej Chémie Edícia vysokoškolských učebníc, Slovenská Technická Univerzita v Bratislave, Vydavateľstvo STU Press, Bratislava 1998, 170 s. (13 AH, príspevok R. Klement, **1.5 AH**). ISBN 80-227-1113-6.
2. Robert Klement., Calculation in Chemistry, Part1: Material Balance, Alexander Dubček University of Trenčín (TnUAD), FunGlass TnUAD, Trenčín 2026, 85 pages. (ISBN 978-80-8295-067-3) (R.Klement, author, **4 AH**)
3. Robert Klement., Calculation in Chemistry, Part2: Acid-Base Equilibria, Complex Ion Formation Equilibria, Solubility Equilibria, Redox Equilibria, Alexander Dubček University of Trenčín (TnUAD), FunGlass TnUAD, Trenčín 2026, 192 pages. (ISBN 978-80-8295-068-0) (R.Klement, author, **9 AH**)

Garantovanie študijných programov a predmetov:

1. Spolugarant (osoba zodpovedná za uskutočňovanie, rozvoj a kvalitu študijného programu) študijného programu 3. stupňa vysokoškolského štúdia „4616 Anorganické technológie a nekovové materiály“ na celouniverzitnom pracovisku FunGlass, Trenčianska univerzita Alexandra Dubčeka v Trenčíne, v študijnom odbore 16. Chemické inžinierstvo a technológie.
2. Učiteľ zabezpečujúci predmet „Teoretické základy molekulovej spektroskopie“ v rámci profilového predmetu „Anorganická technológia a materiály II“.
3. Predseda odborovej komisie.

Účasť v komisiách pre štátne skúšky a dizertačné skúšky

Pravidelne sa zúčastňuje ako člen/predseda štátnej skúšobnej komisie pre dizertačné skúšky a obhajoby dizertačných prác v študijnom programe „4616 Anorganické technológie a nekovové materiály“ na celouniverzitnom pracovisku FunGlass, Trenčianska univerzita Alexandra Dubčeka v Trenčíne.

Miesto	Dátum	Meno, priezvisko, titul (podpis)
V Trenčíne	7.3.2026	Doc. Ing. Robert Klement, PhD.

III. HABILITAČNÁ PRÁCA

Žiadateľ o inauguračné konanie obhájil habilitačnú prácu vo forme súboru publikovaných vedeckých prác doplnených komentárom v Trenčíne dňa 19.11.2018 pred habilitačnou komisiou (predseda habilitačnej komisie: prof. Ing. Marek Liška, DrSc.) schválenou Vedeckou radou TnUAD a menovanou rektorom TnUAD.

Názov habilitačnej práce: „Fotoluminiscenčné vlastnosti aktivátormi dopovaných sklených a polykryštalických systémov pre aplikácie v pevnolátkových svetelných zdrojoch“, 194 s. TnUAD **2018**.

IV. VEDECKÝ VÝSKUM A PUBLIKAČNÁ AKTIVITA

ON 3-U-056

Príloha č. 5

Minimálne kritéria pre obsadzovanie funkčného miesta docent alebo funkčného miesta profesor na FunGlass TnUAD

Minimal criteria for obtaining the title "associated professor" and "professor"

Minimálne povinné požiadavky <i>Minimal obligatory requirements</i>			Poznámka <i>Comment</i>
	docent <i>Associate professor</i>	profesor <i>Professor</i>	profesor
HODNOTENIE PEDAGOGICKEJ ČINNOSTI <i>EVALUATION OF PEDAGOGICAL ACTIVITIES</i>			
Vzdelávacia činnosť a tvorba študijných materiálov <i>Pedagogical activities and preparation of teaching texts</i>			
1. Kontinuálna pedagogická činnosť na VŠ v rozsahu (pedagogické pôsobenie uchádzača na VŠ v študijných programoch uskutočňovaných v študijnom odbore) <i>Pedagogical experiences in a particular field at a university</i>	3 roky po PhD <i>3 years after PhD</i>	6 roky po PhD <i>6 years after PhD</i>	
2. Vysokoškolské učebnice <i>Textbooks</i>	-	1	
Alebo <i>Or</i>			
skriptá, učebné texty, elektronické texty <i>instructional texts and materials, electronic instructional texts</i>	1	2	3
HODNOTENIE VEDECKEJ A VÝSKUMNEJ ČINNOSTI <i>EVALUATION OF SCIENTIFIC AND RESEARCH ACTIVITIES</i>			
II. Vedeckovýskumná aktivita¹⁾ <i>Scientific and Research activities</i>			
Vedecké práce v kategóriách A+, A, A- a B ¹⁾ <i>Scientific and research papers of the category A+, A, A- or B</i>	15 (5)	50 (8) ²⁾	85 (40)
z toho <i>out of which</i>			
vedecké práce v kategóriách A+ a A <i>scientific and research papers of the category A+, A,</i>	6(2)	15 (4) ²⁾	74 (36)
III. Ohlasy na publikačnú aktivitu¹⁾ <i>Citations and Responses</i>			
Citácie/Ohlasy (SCI, WOS, SCOPUS, knižné a iné) spolu ¹⁾ <i>Citations (SCI, WOS, SCOPUS, book and others) total¹⁾</i>	25	80	975+
z toho: <i>out of which</i>			
Citácie registrované vo WOS alebo SCOPUS <i>Citations registered in WOS and SCOPUS</i>	25	70	975+
IV. Vedecká škola a medzinárodná akceptácia <i>Scientific school and international recognition</i>			
1. Výchova doktorandov (skončený/po dizertačnej skúške): <i>Number of supervised doctoral (awarded with PhD title/after midterm dissertation exam)</i>	-	2/0	6/3
2. Spoluriešiteľ/Vedúci výskumného projektu <i>Investigator/Principal investigator of a grant project</i>	3/0	6/1	15/5
3. Medzinárodná akceptácia od odborníkov z rozličných štátov mimo SR (písomné referencie od odborníkov) ³⁾ <i>International recognition by scientific community from other countries than SR (written references from experts in the field)</i>	-	3	3

¹⁾ V zátvorke uviesť počty za posledných 5 rokov (*in parenthesis, declare the numbers over the last 5 years*)

²⁾ Citácie s vylúčením autocitácií všetkých spoluautorov (*Citations with the exclusion of the autocitations of all co-authors*)

Minimálne kritéria pre obsadzovanie funkčného miesta docent alebo funkčného miesta profesor na FunGlass TnUAD

Vysvetlivky (Explanations):

¹ Počet vedeckých prác je bez prepočítania na počet autorov. Rovnako sa neprepočítavajú na počet autorov citácie, patenty a monografie/kapitoly v monografii.
(The number of scientific works is without recalculation to the number of authors. They are also not recalculated for the number of authors of citations, patents and monographs / chapters in the monograph.)

² Zohľadnenie výstupov vo forme monografií/kapitol v monografiách a patentoch:
(Consideration of scientific outputs in the form of monographs / chapters in monographs and patents:)

- Monografia/ kapitola vo vedeckej monografii môže nahradiť najviac tri/jednu vedeckú prácu, podľa rozsahu a vydavateľstva.
(A monograph / chapter in a scientific monograph may replace a maximum of three / one scientific papers, depending on the scope and publishing house.)
- Každý prijatý európsky alebo svetový patent je ekvivalentný 10% odporúčaného počtu vedeckých prác vo vedeckých časopisoch evidovaných v WOS alebo SCOPUS kategórie A alebo A+.
(Each European or world patent received is equivalent to 10% of the recommended number of scientific papers in scientific journals indexed in WOS or SCOPUS databases in the category A or A+.)
- Každý preukázateľne realizovaný patent je ekvivalentný 20% odporúčaného počtu vedeckých prác vo vedeckých časopisoch evidovaných v WOS alebo SCOPUS kategórie A alebo A+.
(Each demonstrably realized patent is equivalent to 20% of the recommended number of scientific in scientific journals indexed in WOS or SCOPUS databases in the category A or A+.)

O miere náhrady sa explicitne vyjadrí komisia vo svojom stanovisku.
(The extent of substitution will be explicitly considered by the commission in its statement.)

³ Písomné referencie od popredných zahraničných odborníkov z aspoň troch rozličných štátov mimo Slovenskej republiky, pričom v referenciách bude potvrdené, že uchádzač spĺňa požiadavky na pôsobenie na funkčnom mieste profesora v medzinárodnom kontexte.
(The written references from recognized scientist in the field, form at least three different countries out of Slovak republic. In the references should be stated that an applicant fulfill requirements for the position of university professor at the international level.)

Kategorizácia výstupov publikačnej činnosti pre účel definovania minimálnych kritérií HKaIK:
(Category of publication outputs for the purpose of definition of minimal criteria HKaIK:)

A+	vedecká publikácia vo vedeckom časopise evidovanom vo WOS alebo SCOPUS zaradené do kvartilu Q1, medzinárodný patent (scientific paper published in a scientific journal registered in WOS or SCOPUS classified as Q1, international patent)
A	vedecká publikácia vo vedeckom časopise evidovanom vo WOS alebo SCOPUS zaradené do kvartilu Q2, monografia v MRV (Medzinárodne renomované vydavateľstvo) (scientific paper published in a scientific journal registered in WOS or SCOPUS classified as Q2, monographs published in internationally recognized publisher)
A-	vedecká publikácia vo vedeckom časopise evidovanom vo WOS alebo SCOPUS zaradené do kvartilu Q3 alebo Q4, národný patent (scientific paper published in a scientific journal registered in WOS or SCOPUS classified as Q3 or Q4, national patent)
B	ostatné publikácie evidované vo WOS alebo SCOPUS, ostatné recenzované publikácie v časopisoch (other publications registered in WOS or SCOPUS, other reviewed publications in journals)

Akceptuje sa zaradenie vedeckého časopisu do kategórie príslušného kvartilu (Q1-Q4) podľa WOS (Web of Science) alebo SCOPUS. (Categorisation of the scientific journal to quartiles (Q1-Q4) according to WOS or SCOPUS, respectively.)

A. PUBLIKAČNÁ AKTIVITA

Diplomová a dizertačná práca

R. Klement: *ESR spektroskopía komplexov Cu(II) a Co(II) s ligandami typu Schiffových báz* [Diplomová práca].

Bratislava: CHTF STU, **1993**, 68 s. (školiťel': Prof. Ing. Marián Valko, DrSc.)

R. Klement: *Štúdium štvorcovo-planárnych komplexných zlúčenín Cu(II) a Co(II) s derivátmi ligandov typu Schiffových báz Salen a Tetrahydrosalen* [Dizertačná práca].

Bratislava: CHTF STU, **2001**, 144 s. (školiťel': Prof. Ing. Peter Pelikán, DrSc.)

Kapitoly vo vedeckých monografiách vydané v zahraničných vydavateľstvách (ABC – 3)

1. D. Galusek, J. Sedláček, **R. Klement**, P. Švančárek: *Silicon carbide- containing alumina nanocomposites: processing and properties*, Chapter 4, s. 43 – 78 In: *Advances in ceramic matrix composites: Book Series: Woodhead Publishing Series in Composites Science and Engineering*, Ed. by I.M. Low, Woodhead Publishing Limited, Cambridge, **2014**. ISBN 978-0-85709-120-128.
2. **R. Klement**, P. Švančárek, M. Parchovianský, J. Sedláček, D. Galusek: *Al₂O₃-SiC nanocomposites: preparation, microstructure, and properties*, Chapter 4, s. 49 – 92, In: *Advances in ceramic matrix composites: Book Series: Woodhead Publishing Series in Composites Science and Engineering*, 2nd edition, Ed. by I.M. Low, Woodhead Publishing Limited, Cambridge, **2018**. ISBN 978-0-08-102166-8.
3. **R. Klement**, P. Švančárek, M. Parchovianský, J. Sedláček, D. Galusek: *Al₂O₃-SiC nanocomposites: preparation, microstructure, and properties*, Chapter 4, s. 51 – 95, In: *Advances in ceramic matrix composites: Book Series: Woodhead Publishing Series in Composites Science and Engineering*, 3rd edition, Ed. by I.M. Low, S. Li, C. Hu, Woodhead Publishing Limited, Elsevier, London, **2025**. ISBN 978-0-443-18598-4.

Kapitoly vo vedeckých monografiách vydané v domácich vydavateľstvách (ABD – 3)

1. **R. Klement:** *Fullerény a uhlíkové nanorúrky – Nanomateriál budúcnosti* (Fullerenes and Carbon Nanotubes – A Nanomaterial of the Future), s. 392 – 408 In: M. Balog, M. Tatarko a kol.: *Odhalené tajomstvá chémie* (The secrets of chemistry revealed), VEDA, Vydavateľstvo SAV, Bratislava, **2007**. ISBN 978-80-224-0957-5.
2. **R. Klement:** *Fullerény a uhlíkové nanorúrky – Nanomateriál budúcnosti* (Fullerenes and Carbon Nanotubes – A Nanomaterial of the Future), s. 392-408 In: M. Balog, M. Tatarko a kol.: *Odhalené tajomstvá chémie* (The secrets of

- chemistry revealed), 2nd Edition (revised), VEDA, Vydavateľstvo SAV, Bratislava, **2018**. ISBN 978-80-224-1681-8.
3. **R. Klement**: *Fullerény a uhlíkové nanorúrky – Nanomateriál budúcnosti* (Fullerenes and Carbon Nanotubes – A Nanomaterial of the Future), pp. 392-408
In: M. Balog, M. Tatarko a kol.: *Odhalené tajomstvá chémie* (The secrets of chemistry revealed), 3rd Edition (revised), VEDA, Vydavateľstvo SAV, Bratislava, **2024**. ISBN 978-80-224-2067-9.

Kapitoly vo vysokoškolských učebniciach vydané v domácich vydavateľstvách (ACD – 1)

1. Peter Šimon a kolektív (**R. Klement**), *Laboratórne Cvičenia z Fyzikálnej Chémie*
Edícia vysokoškolských učebníc, Slovenská Technická Univerzita v Bratislave, Vydavateľstvo STU Press, Bratislava 1998, 170 s. (13 AH, príspevok R. Klement, **1.5 AH**). ISBN 80-227-1113-6.

Editované zborníky (FAI – 2)

1. M. Liška, D. Galusek, **R. Klement**, V. Petrušková (editors), **Glass – The Challenge for the 21st Century**, Proceedings of the 9th Conference of the European Society of Glass Science and Technology with the Annual Meeting of the International Commission on Glass, Trenčín, Slovakia, 22-26 June, Trans Tech Publications, Zurich, Switzerland, **2008**, 692 s. ISBN 0-87849-387-5, ISBN-13 978-0-87849-387-6.
2. M. Liška, **R. Klement** (editors), *Zborník príspevkov, Slovenská a česká konferencia o skle Trenčianske Teplice, Slovakia, 30. November – 2. December, špeciálne číslo časopisu Sklář a Keramik, ročník 61 (2011)*, Vydavateľstvo Českéj sklárskej spoločnosti, Jablonec nad Nisou, Česká republika **2011**, 232 s. ISBN 978-80-260-1068-5.

Vedecké práce v zahraničných karentovaných časopisoch (ADC – 83)

1. M. Valko, **R. Klement**, P. Pelikán, R. Boča, Ľ. Dlháň, A. Böttcher, H. Elias, L. Müller:
Copper(II) and Cobalt(II) complexes with derivatives of Salen and Tetrahydrosalen: An electron spin resonance, magnetic susceptibility, and quantum chemical study.
J. Phys. Chem. **1995**, 99 (1), 137–143. (IF: 4.173) Q1
2. M. Mazúr, M. Valko, **R. Klement**, H. Morris:
Quantitative electron paramagnetic resonance (EPR) spectrometry with a TE104 double rectangular cavity, Part 1. A simple alignment procedure for the precision positioning of the sample
Anal. Chim. Acta **1996**, 333 (3), 249–252. (IF: 4.950) Q1

3. M. Mazúr, M. Valko, H. Morris, **R. Klement**:
Quantitative electron paramagnetic resonance (EPR) spectrometry with a TE104 double rectangular cavity, Part 2. An analysis of sample and TE104 cavity error sources associated with the movement of line-like samples into the TE104 cavity
Anal. Chim. Acta **1996**, 333 (3), 253–265. (IF: 4.950) Q1
4. W. Linert, F. Renz, R. Boča, M. Valko, **R. Klement**, M. Mazúr:
Magnetic properties and electronic structure of five- and six-coordinate manganese(II)2,6-bis(benzimidazol-2-yl) pyridine complexes
J. Coord. Chem. **1996**, 40 (4), 293–309. (IF: 1.795) Q3
5. M. Valko, R. Boča, **R. Klement**, J. Kožíšek, M. Mazúr, P. Pelikán, H. Morris, H. Elias, L. Müller:
Effect of hydrogenation on electronic and distant magnetic properties in Copper(II) complexes with derivatives of Tetrahydrosalen and Salen. X-ray crystal structure of [Cu{Bu,Me (saltmen)}] complex
Polyhedron **1997**, 16 (6), 903–908. (IF: 1.926) Q2
6. R. Boča, H. Elias, W. Haase, M. Hüber, **R. Klement**, L. Müller, H. Paulus, I. Svoboda, M. Valko:
Spectroscopic and magnetic properties and structure of a five-coordinate, O₂-binding Cobalt(II) Schiff Base complex and of the Copper(II) analogue
Inorg. Chim. Acta **1998**, 278 (2), 127–135. (IF: 2.002) Q2
7. **R. Klement**, F. Stock, H. Elias, H. Paulus, P. Pelikán, M. Valko, M. Mazúr:
Copper(II) complexes with derivatives of Salen and Tetrahydrosalen: A spectroscopic, electrochemical and structural study
Polyhedron **1999**, 18 (27), 3617–3628. (IF: 1.926) Q2
8. M. Dunaj-Jurčo, I. Potočňák, D. Mikloš, **R. Klement**:
Complexes with new chelate anionic ligands formed by nucleophilic addition in Copper(II) coordination sphere III. The crystal structure of (2,2'-bipyridine-N,N')(cyanato-N)-[methyl(2-cyano-2-imidoxy ethaneimidate-N,N')] Copper(II) and (2,2'-bipyridine-N,N')(2-cyano-2-imidoxy ethaneimidate-N,N')Copper(II)
Collect. Czech. Chem. Commun. **1999**, 64 (4), 600–612. (IF: 1.137) Q3
9. M. Valko, M. Mazúr, H. Morris, **R. Klement**, C.J. Williams, M. Melník:
Effect of coordinated base on magnetic behaviour of Copper(II) carboxylates with fatty acid chains (An ESR study)
J. Coord. Chem. **2000**, 52 (2), 129–138. (IF: 1.795) Q3
10. P. Baran, R. Boča, M. Breza, H. Elias, H. Fuess, V. Jorík, **R. Klement**, I. Svoboda:
The spectroscopic and structural properties of Copper(II) complexes of the novel tridentate (ONO) pyridine N-oxide Hpoxap
Polyhedron **2002**, 21 (16), 1561–1571. (IF: 1.926) Q2
11. J. Cambedouzou, V. Pichot, S. Rols, P. Launois, P. Petit, **R. Klement**, H. Kataura, R. Almairac:
On the diffraction pattern of C₆₀ peapods
Eur. Phys. J. B **2004**, 42 (1), 31–45. (IF: 1.436) Q1

12. M. Liška, J. Macháček, O. Gedeon, **R. Klement**:
Molecular dynamics of the Na₂O-MgO-CaO-SiO₂ glasses
Glastech. Ber. Glass Sci. Technol. **2004**, 77C, 267–272. (IF: 0.365) Q3
13. M. Liška, **R. Klement**, J. Macháček, O. Gedeon:
Inverse thermodynamic modelling of glass from Raman spectroscopical and molecular dynamics results
Phys. Chem. Glasses **2005**, 46 (2), 108–111. (IF: 0.599) Q3
14. A. Huber, L. Müller, H. Elias, **R. Klement**, M. Valko:
Cobalt(II) complexes with substituted Salen-type ligands and their dioxygen affinity in N,N-Dimethylformamide at various temperatures
Eur. J. Inorg. Chem. **2005**, (8), 1459–1467. (IF: 2.444) Q1
15. P. Kluvánek, **R. Klement**, M. Karáčoň:
Investigation of the conductivity of the lithium borosilicate glass system
J. Non-Cryst. Solids. **2007**, 353 (18-21), 2004–2007. (IF: 2.124) Q1
16. J. Kraxner, **R. Klement**, M. Liška:
High-temperature viscosity and density of alumino-borosilicate glasses as a model system for commercial E-Glass
Ceram.-Silik. **2008**, 52 (3), 148–154. (IF: 0.439) Q2
17. J. Kraxner, M. Liška, **R. Klement**, M. Chromčíková:
Surface tension of borosilicate melts with the composition close to the E-glass
Ceram.-Silik. **2009**, 53 (2), 141–143. (IF: 0.439) Q2
18. **R. Klement**, J. Kraxner, M. Liška:
Spectroscopic analysis of iron doped glasses with composition close to the E-glass: A preliminary study
Ceram.-Silik. **2009**, 53 (3), 180–183. (IF: 0.439) Q2
19. D. Galusek, **R. Klement**, J. Sedláček, M. Balog, C. Fasel, J. Zhang, M.A. Crimp, R. Riedel:
Al₂O₃-SiC composites prepared by infiltration of pre-sintered alumina with a poly(allyl)carbosilane
J. Eur. Ceram. Soc. **2011**, 31 (1-2), 111–119. (IF: 3.454) Q1
20. A. Prnová, A. Domanická, **R. Klement**, J. Kraxner, M. Polovka, M. Pentrák, D. Galusek, P. Šimurka, J. Kozánková:
Er- and Nd-doped yttrium aluminosilicate glasses: Preparation and characterization
Opt. Materials **2011**, 33 (12), 1872–1878. (IF: 2.238) Q2
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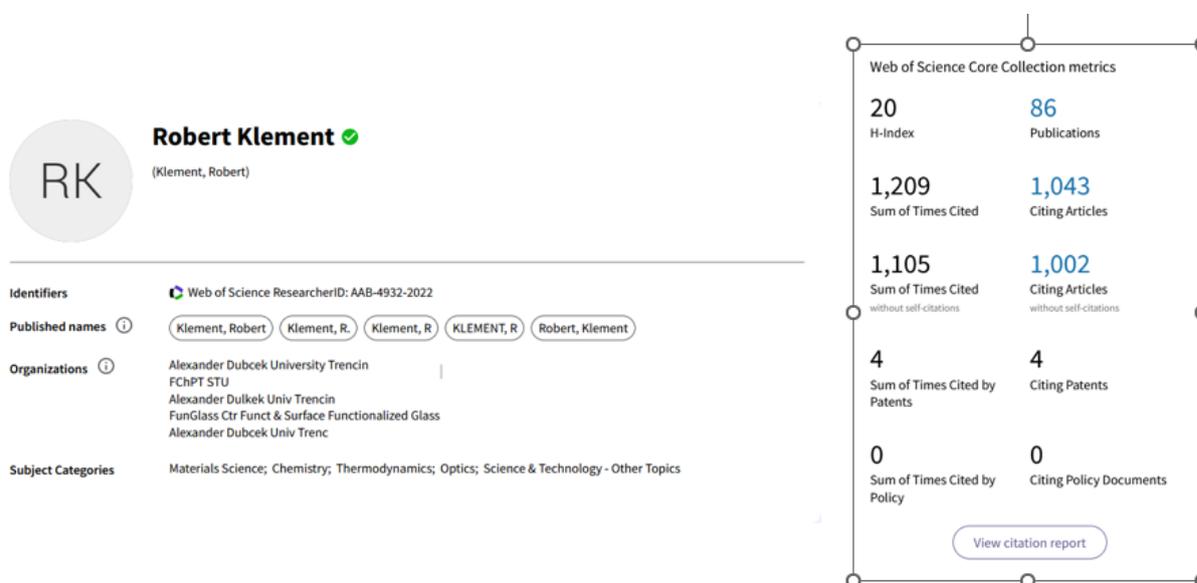
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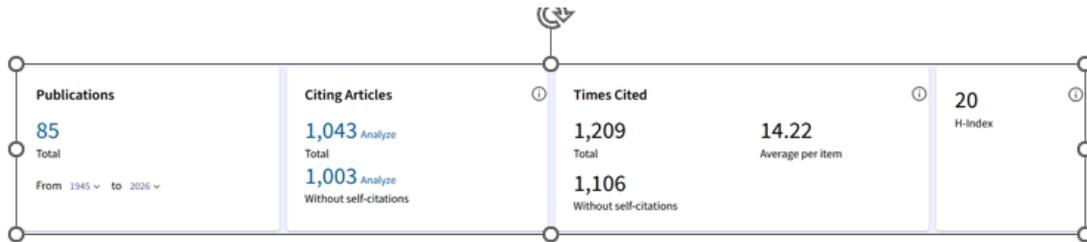
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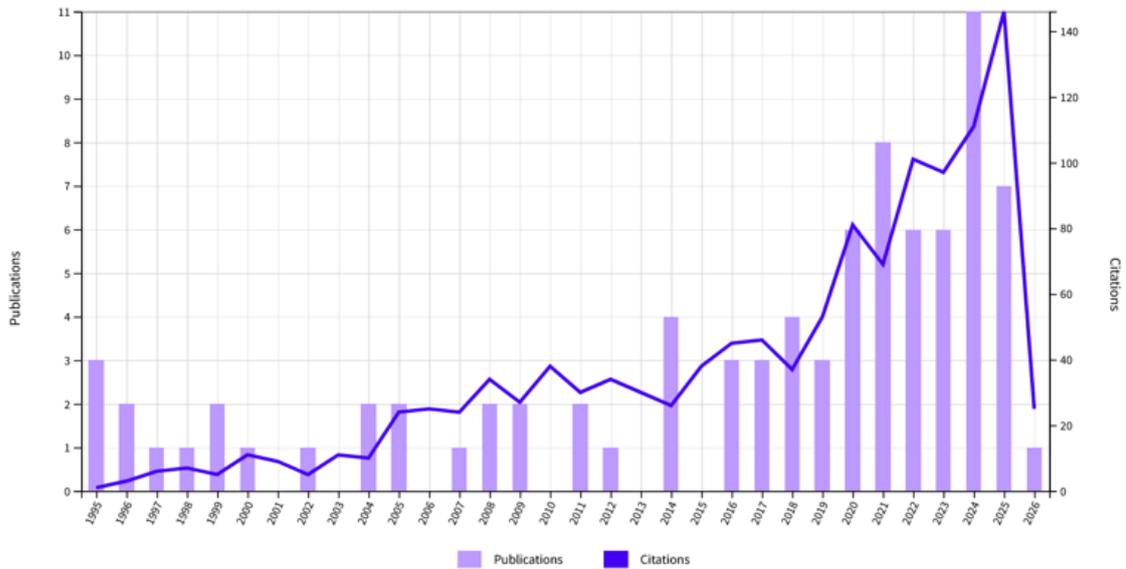


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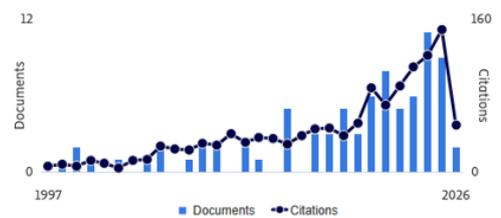
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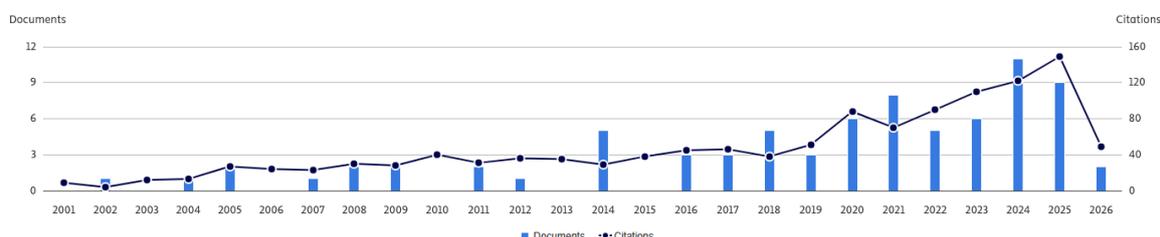
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Electrical transport and dielectric relaxation in $5\text{Fe}_2\text{O}_3\text{--}40\text{ZnO--}55\text{P}_2\text{O}_5$ iron zinc phosphate bulk glass
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Rare earth modification of smectites and their use in luminescent up-conversion emission
Appl. Clay Sci. **2025**, 266, 107685.
1. A. Yamagishi, K. Takimoto, R. Ito, J. Yoshida, H. Sato: Triplet-triplet annihilation up-conversion of cationic iridium(III) complex solubilized by organically-modified hectorite in a green solvent, *Appl. Clay Sci.* **2025**, 272, 107828.
 2. Y. Xia, J. Zhu, H. Wu, J. Dong, R. Zhou, S. Tan, Y. Hu, L. Wu: Synergistic enhancement of thermal and optical properties of phenyl liquid silicone rubber reinforced by liquid phenylethyl/H-containing POSS, *Polym. Compos.* **2025**, 46(S2), S105-S118.
73. G. Galleani, R. Dagupati, B. Wolfrum, **R. Klement**, J.J. Velazquez, D. Galusek:
Stokes and Anti-Stokes emission and biological window III (1.53 μm) luminescence thermometry analysis from Stark sublevels in Er^{3+} , Yb^{3+} -doped fluorophosphate glasses
Open Ceram. **2025**, 22, 100762.
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Miesto	Dátum	Meno, priezvisko, titul (podpis)
V Trenčíne	7.3.2026	Doc. Ing. Robert Klement, PhD.

C. RIEŠENIE PROJEKTOV

Žiadateľ o inauguračné konanie bol **zodpovedným riešiteľom 6 vedecko-výskumných projektov** (4 x VEGA, 1 x CUGA, 1 x APVV), je/bol **spoluriešiteľom 15 vedecko-výskumných projektov** (4 x APVV, 6 x VEGA, 4 x projekty ŠF, 1 x zahraničný projekt), **3** pedagogicky zameraných projektov (3 x projekty ŠF). V súčasnosti je zodpovedným riešiteľom 1 podaného VEGA projektu a 1 podaného APVV projektu.

1. **APVV-20-P06405**

Optimalizácia tavenia skloviny EUTAL.

Zodpovedný riešiteľ: Prof. Ing. M. Liška, DrSc.

člen riešiteľského kolektívu

Doba riešenia projektu: 2005-2007

2. **CUGA 19/2007**

Spektroskopické štúdium skiel v sústavách MgO-CaO-Al₂O₃-B₂O₃-SiO₂ a Al₂O₃-CaO dopovaných iónmi prechodných prvkov a iónmi prvkov vzácnych zemín.

Zodpovedný riešiteľ: **Ing. Robert Klement, PhD.**

Doba riešenia projektu: 2007-2008

3. **VEGA 1/3578/06**

Štruktúra a vlastnosti kremičitanových skiel – termodynamické modely a molekulodynamické simulácie verzus experiment.

Zodpovedný riešiteľ: Prof. Ing. M. Liška, DrSc.

člen riešiteľského kolektívu

Doba riešenia projektu: 2006-2008

4. **VEGA 2/6181/26**

Transparentné materiály na báze Al₂O₃ s výnimočnými mechanickými vlastnosťami.

Zodpovedný riešiteľ: Doc. Ing. D. Galusek, PhD.

člen riešiteľského kolektívu

Doba riešenia projektu: 2006-2008

5. **APVV 0171-06**

Výskum keramických materiálov pre vysoko korozívne prostredia.

Zodpovedný riešiteľ: Prof. RNDr. Pavol Šajgalík DrSc.

člen riešiteľského kolektívu

Doba riešenia projektu: 2006-2009

6. **VEGA 1/0330/09**

Štruktúra a vlastnosti oxidových skiel - termodynamické modely, vibračná spektroskopia a molekulová dynamika.

Zodpovedný riešiteľ: Prof. Ing. M. Liška, DrSc.

člen riešiteľského kolektívu

Doba riešenia projektu: 2009-2011

7. **VEGA 1/0603/09**
Sklené a sklokeramické materiály na báze aluminátov vzácnych zemín s výnimočnými mechanickými a optickými vlastnosťami.
Zodpovedný riešiteľ: Ing. R. Klement, PhD.
Doba riešenia projektu: 2009-2011
8. **CEKSIM – ITMS 262 201 200 56 OP Výskum a vývoj Európskeho fondu regionálneho rozvoja: Centrum excelentnosti pre keramiku, sklo a silikátové materiály.**
Zodpovedný riešiteľ: Prof. Ing. D. Galusek, DrSc.
člen riešiteľského kolektívu
Doba riešenia projektu: 2010-2013
9. **PVTECHSKLO – ITMS 262 202 200 72 OP Výskum a vývoj Európskeho fondu regionálneho rozvoja: Priemyselný výskum pre potreby zefektívnenia unikátnej technológie tavenia a tvarovania úžitkového skla.**
Zodpovedný riešiteľ: Doc. Ing. P. Šimurka, PhD.
člen riešiteľského kolektívu
Doba riešenia projektu: 2010-2015
10. **26110230009 Operačný program Vzdelávanie: Digitalizácia TnUAD: Rozvoj inovatívnych foriem vzdelávania a skvalitnenie študijných programov.**
Zodpovedný riešiteľ: TnUAD
člen riešiteľského kolektívu
Doba riešenia projektu: 2011-2013
11. **VEGA 2/0165/12**
Štúdium mechanizmu korózie materiálov používaných pri tavení priemyselne vyrábaných skiel.
Zodpovedný riešiteľ: Doc. Ing. P. Šimurka, PhD.
člen riešiteľského kolektívu
Doba riešenia projektu: 2012-2015
12. **APVV 0218-11**
Mechanizmy korózie a mikromechanické vlastnosti dentálnych materiálov
Zodpovedný riešiteľ: Prof. Ing. D. Galusek, DrSc.
člen riešiteľského kolektívu
Doba riešenia projektu: 2012-2015
13. **KVŠ – ITMS 261 102 300 99**
Trenčianska univerzita Alexandra Dubčeka v Trenčíne chce ponúkať kvalitné a moderné vzdelávanie.
Zodpovedný riešiteľ: Prof. Ing. M. Liška, DrSc.
člen riešiteľského kolektívu
Doba riešenia projektu: 2013-2015
14. **VEGA 1/0631/14**
Nové sklené a sklokeramické luminiscenčné materiály na báze hlinitanov vzácnych zemín pre aplikácie v LED diódach vyžarujúcich biele svetlo
Zodpovedný riešiteľ: Ing. R. Klement, PhD.

Doba riešenia projektu: 2014-2017

15. **VEGA 2/0058/14**

Keramické vrstvy pripravené z organokremičitých prekurzorov pre vysokoteplotnú protikoróznú ochranu kovov

Zodpovedný riešiteľ: Prof. Ing. D. Galusek, DrSc.

člen riešiteľského kolektívu

Doba riešenia projektu: 2014-2016

16. **SAS-NSC JRP 2012/14**

Nové anorganické fosfory bez obsahu prvkov vzácnych zemín pre energeticky úsporné osvetľovacie zdroje.

Zodpovedný riešiteľ: Prof. Ing. D. Galusek, DrSc.

člen riešiteľského kolektívu

Doba riešenia projektu: 2013-2015

17. **APVV 0014-15**

Kompozitné vrstvy pre vysokoteplotnú protikoróznú ochranu kovov

Zodpovedný riešiteľ: Prof. Ing. D. Galusek, DrSc.

člen riešiteľského kolektívu

Doba riešenia projektu: 2016-2020

18. **VEGA 2/0026/17**

Transparentné polykryštalické keramické materiály so submikrónovou mikroštruktúrou a luminiscenčnými vlastnosťami

Zodpovedný riešiteľ: Prof. Ing. D. Galusek, DrSc.

člen riešiteľského kolektívu

Doba riešenia projektu: 2017-2020

19. **VEGA 1/0527/18**

Nové anorganické fosfory na báze stechiometrických hlinitanov a kremičitanov s dlhodobou svetelnou emisiou pre optické a biomedicínske aplikácie

Zodpovedný riešiteľ: Ing. R. Klement, PhD.

Doba riešenia projektu: 2018-2021

Hodnotený ako projekt s dosiahnutými vynikajúcimi výsledkami.

20. **H2020-Widespread-01-2016-2017-TeamingPhase2**

Centre for functional and surface functionalized glasses- FunGlass

Zodpovedný riešiteľ: Prof. Ing. D. Galusek, DrSc.

člen riešiteľského kolektívu

Doba riešenia projektu: 2017-2024

21. **APVV 17-0049**

Nové sklené a sklokeramické fosfory na báze hlinitanov vzácnych zemín pre aplikácie v pevnolátkových energiách šetriacich svetelných zdrojoch vyžarujúcich biele svetlo (pc-WLED diódy)

Zodpovedný riešiteľ: Doc. Ing. R. Klement, PhD.

Doba riešenia projektu: 2018-2022

Hodnotený ako projekt s dosiahnutými vynikajúcimi výsledkami.

22. **VEGA 1/0476/22**
Luminofory s nulovým teplotným zhášaním luminiscencie pre aplikácie v pc-WLED s NUV excitáciou
 Zodpovedný riešiteľ: **Doc. Ing. R. Klement, PhD.**
 Doba riešenia projektu: 2022-2024
 Hodnotený ako projekt s dosiahnutými vynikajúcimi výsledkami.
23. **Plán obnovy EÚ: Výzva na podporu projektov propagácie vysokých škôl v zahraničí, Podpora internacionalizácie v akademickom prostredí (10I04-20-V03-00013)**
 člen riešiteľského kolektívu
 Doba riešenia projektu: 2024-2025
24. **Plán obnovy EÚ**
Development of advanced luminescent glass 3D structures (LUMIPIG)
 Zodpovedný riešiteľ: Ing. M. Micháľková, PhD.
 člen riešiteľského kolektívu
 Doba riešenia projektu: 2024-2026
25. **VEGA 1/0300/26 – podaný**
Vysokoentropická transparentná luminiscenčná keramika so širokospektrálnymi emisnými vlastnosťami pre fotonické aplikácie novej generácie: Cez kontrolu zloženia po luminiscenciu na mieru.
 Zodpovedný riešiteľ: **Doc. Ing. R. Klement, PhD.**
 Doba riešenia projektu: 2026-2029
26. **APVV 25-0431 – podaný**
Vysokoentropická optická keramika: Od kontroly zloženia po luminiscenciu na mieru
 Zodpovedný riešiteľ: **Doc. Ing. R. Klement, PhD.**
 Doba riešenia projektu: 2026-2030

Miesto	Dátum	Meno, priezvisko, titul (podpis)
V Trenčíne	7.3.2026	Doc. Ing. Robert Klement, PhD.

V. VEDECKÁ VÝCHOVA

Žiadateľ o inauguračné konanie viedol od roku 2008 celkovo 14 doktorandov (študijný odbor: 16. Chemické inžinierstvo a technológie; študijný program: 4616 Anorganické technológie a nekovové materiály), z toho 6 úspešne ukončili doktorandské štúdium obhajobou dizertačnej práce, 3 doktorandi úspešne absolvovali dizertačnú skúšku (1 je po odovzdaní dizertačnej práce), 2 doktorandi sú pred dizertačnou skúškou, 2 doktorandi štúdium zanechali po obhájení dizertačnej skúšky a 1 doktorandka zanechala štúdium zo zdravotných dôvodov po prvom roku štúdia. Ďalej viedol 6 diplomantov a 2 bakalárov.

Vedecká výchova doktorandov:

1. Ing. Branislav Hruška (2009-2013)
2. Ing. Petra Gaalová (2011-2015)
3. Ing. Katarína Haladejová (2012-2016)
4. Mgr. Lívia Dvorská (2013-2015)
5. Ing. Monika Vaščíková (2014-2015)
6. Ing. Alena Akusevich (2018-2025)
7. MSc. Bruno Wolfrum (2019-2025)
8. MSc. Nguyen Mai Phuong Truong (2019-2024)
9. MSc. Hossein Ebrahim Hosseini Tazeh Kandi (2020-2026)
10. MSc. Mir Saeed Sajjadi (2021-2026)
11. MSc. Shubham Gupta (2023-doteraz)
12. MSc. Mina Kianmehr (2024-doteraz)
13. Ing. Marek Rotter (2023-doteraz)
14. Ing. Tereza Havlíková (2024-doteraz)

Úspešne obhájené dizertačné práce:

1. Ing. Branislav Hruška (VILA TnUAD Trenčín, **2013**): Štruktúra a spektrálne vlastnosti sklokeramických materiálov na báze binárnych a ternárnych aluminátov prvkov vzácnych zemín – 135 s. Školiteľ: Robert Klement. Obhájené: 08/2013.
2. Ing. Petra Gaalová (VILA TnUAD Trenčín, **2015**): Korózia prírodných a syntetických biomateriálov v kyslých médiách a jej vplyv na mechanické vlastnosti – 125 s. Školiteľ: Robert Klement. Obhájené: 08/2015.
3. Ing. Katarína Haladejová (VILA TnUAD Trenčín, **2016**): Nové sklené a sklokeramické luminiscenčné materiály na báze hlinitanov vzácnych zemín pre aplikácie v LED diódach vyžarujúcich biele svetlo – 153 s. Školiteľ: Robert Klement. Obhájené: 08/2016.
4. MSc. Nguyen Mai Phuong Truong (FunGlass TnUAD Trenčín, **2024**): Luminescence application via photon-conversion in rare-earth-doped glass and glass-ceramics – 151 s. Školiteľ: Robert Klement. Obhájené: 12/2024.
5. Ing. Alena Akusevich (FunGlass Trenčín, **2025**): Crystallization behaviour and luminescent properties of undoped and Ce³⁺-doped glass microspheres in the System YAG-Al₂O₃ – 163 s. Školiteľ: Robert Klement. Obhájené: 08/2025.

6. MSc. Hossein Ebrahim Hosseini Tazeh Kandi (FunGlass TnUAD Trenčín, **2025**): Mechanoluminescence and persistent luminescence of Bi-doped germanates – 205 s. Školiteľ: Robert Klement. Obhájené: 01/2026.

Doktorandi po úspešnom absolvovaní dizertačnej skúsky:

1. MSc. Mir Saeed Sajjadi (odovzdaná dizertačná práca)
Téma DP: Advanced multi-component heterogeneous photocatalysts for environmental remediation
2. MSc. Shubham Gupta
Téma DP: Luminofores s nízkym teplotným zhasaním luminiscencie pre aplikácie v w-LED s NUV excitáciou / Near zero-thermal-quenching phosphors for NUV converted w-LEDs
3. Ing. Marek Rotter
Téma DP: Pokročilé multifunkčné keramické materiály / Advanced multifunctional ceramic materials

Doktorandi pred absolvovaním dizertačnej skúsky:

1. MSc. Mina Kianmehr
Téma DP: Fotosenzitizérmi funkcionalizované nanočastice pre aplikácie vo fotodynamickej terapii / Covalently functionalized nanoparticles with photosensitizers for photodynamic therapy application
2. Ing. Tereza Havlíková
Téma DP: Multifunkčné pokročilé keramické materiály / Advanced multifunctional ceramic materials

Úspešne obhájené diplomové práce:

1. Michal Karáčoň (FPT TnUAD Púchov, **2006**): Využitie impedančnej spektroskopie pri štúdiu skiel a keramických materiálov – 64 s. Školiteľ: Robert Klement
Ocenenie: 2. miesto – cena Slovenskej Sklárskej Spoločnosti.
2. Michal Naď (FPT TnUAD Púchov, **2007**): Fyzikálne vlastnosti a stabilita peny boritanokremičitanových tavenín – 78 s. Školiteľ: Robert Klement
3. Branislav Hruška (FPT TnUAD Púchov, **2009**): Štúdium vlastností boritano-hlinitano-kremičitanových skiel, so zložením blízkym E-sklu, dopovaných Fe₂O₃ – 86 s. Školiteľ: Robert Klement
4. Samuel Fujak (FPT TnUAD Púchov, **2011**): Štúdium redoxných rovnováh polyvalentných prvkov v priemyselne vyrábaných kremičitanových sklách a sklotvorných taveninách – 64 s. Školiteľ: Robert Klement

5. Katarína Haladejová (FPT TnUAD Púchov, **2012**): Príprava a štúdium vlastností hlinitanových skiel v sústave $RE_2O_3-Al_2O_3$, dopovaných vybranými luminiscenčne aktívnymi iónmi prvkov vzácnych zemín – 75 s. Školiteľ: Robert Klement
6. Radovan Húserka (VILA TnUAD Trenčín, **2017**): Príprava a štúdium spektrálnych vlastností Eu^{3+} a Eu^{2+} dopovanej sústavy $Y_2O_3-Al_2O_3$ – 85 s. Školiteľ: Robert Klement

Miesto	Dátum	Meno, priezvisko, titul (podpis)
V Trenčíne	7.3.2026	Doc. Ing. Robert Klement, PhD.

VI. OSTATNÁ ODBORNÁ ČINNOSŤ

Členstvo v národných profesijných organizáciách:

- Slovenská sklárska spoločnosť (člen 2004-2014); člen predstavenstva (2004-2011)
- Slovenská silikátová spoločnosť (člen, 2017-doteraz)

Členstvo v organizačných výboroch medzinárodných vedeckých konferencií:

- Norbert Kreidl Memorial Conference, 23.-26.6.2004, Trenčín
- 8. ESG conference, 22-26.6.2008, Trenčín
- Slovenská a česká konferencia o skle, 30.11.-2.12.2011, Trenčianske Teplice

Členstvo v komisiách na TnUAD:

- Člen komisie pre štátne záverečné skúšky II. stupňa vysokoškolského štúdia v študijnom programe „5.2.19 Anorganické technológie a nekovové materiály“
- Člen komisie pre štátne záverečné skúšky III. stupňa vysokoškolského štúdia v študijnom programe „4616 Anorganické technológie a nekovové materiály“
- Člen komisie pre doktorandské dizertačné skúšky v študijnom programe „4616 Anorganické technológie a nekovové materiály“
- Člen komisie pre príjímacie konanie na III. stupeň vysokoškolského štúdia v študijnom programe „4616 Anorganické technológie a nekovové materiály“
- Predseda odborovej komisie; študijný program „4616 Anorganické technológie a nekovové materiály“.

Členstvo vo vedeckých radách:

- Člen Vedeckej rady TnUAD (od 2020-doteraz)
- Člen Vedeckej rady FŠT TnUAD (2014-2017; 2021-doteraz)

Vypracované oponentské posudky doktorandských dizertačných prác:

1. Peter Barborík: Štúdium potenciálu fluoridových tavenín pre vysokoteplotné aplikácie; Školiteľ: Doc. Ing. Miroslav Boča, PhD.; FCHPT STU Bratislava, 2013.
2. Simona Lendvayová: Termická stabilita oxidových skiel; Školiteľ: Prof. Ing. Eugen Jóna, DrSc.; FPT TnUAD Púchov, 2013.
3. Mária Zichová: Skúmanie vplyvu kovových a nekovových povlakov aplikovaných za účelom koróznej odolnosti materiálov; Školiteľ: Doc. Ing. Harold Mäsiar, PhD.; FŠT TnUAD Trenčín, 2015.

Vypracované oponentské posudky habilitačných prác:

Ing. Jozef Švorec, PhD.: Komplexné zlúčeniny Cu(II) s biologicky aktívnymi ligandami: príprava, štruktúra, spektroskopické štúdium, magnetické a biologické vlastnosti; FCHPT STU Bratislava, 2021.

Vyžiadané posudky na vedecké grantové projekty v SR:

1. VEGA 1/0410/12: „Diagnostika špeciálnych skiel určených pre aplikácie v infračervenej oblasti spektra pomocou fyzikálnych metód“
2. Bilaterálny projekt SAV – AV ČR: „Vývoj nových pokročilých keramických kompozitov pre vesmírne aplikácie“

Vyžiadané recenzie vedeckých prác v zahraničných karentovaných časopisoch:*Ceramics International:*

1. Manuscript CERI-17-01570: „Structural, electrical and antimicrobial characterization of green synthesized ZnO nanorods from aqueous Mentha extract“
2. Manuscript CERI-17-02604 – R1/R2/R3: „Synthesis and characterization of NiO and Ni nanoparticles using nanocrystalline cellulose (NCC) as a template“
3. Manuscript CERI-17-05523 – R1/R2: „Hierarchical nanostructured VN microspheres assembled with porous nanosheets fabricated by a template-free route“
4. Manuscript CERI-17-05867 – R1: „Fabrication of pure monoclinic VO₂ nanoporous nanorods via a mild pyrolysis process“
5. Manuscript CERI-18-00520: „Synthesis and characterization of CoFe₂O₄/BNT-BT0.08 core-shell nanotubes by a template based sol-gel method“
6. Manuscript CERI-D-18-003727: „Lu³⁺-doped ZnO Nanorods: Synthesis, Electrical and Optical Properties“
7. Manuscript CERI-D-18-07546 – R1/R2: „The impact of the reaction atmosphere on the additive-free growth of Mg₂B₂O₅ nanorods“
8. Manuscript CERI-D-18-10943: „Growth of ZnS nanospheres, nanorods and mixed hexagonal cubic and rectangular-like nano-grains derived by chemical solution process; A comparative study on structural optical and dielectric properties“
9. Manuscript CERI-D-19-04884: „Thermal, spectroscopic and microstructural characterization of Sr- and Mg-doped lanthanum gallate synthesized by soft chemistry route“
10. Manuscript CERI-D-23-05940: „Fabrication and optical properties of YSAG:Cr optical ceramics“

MRS Communications:

11. Manuscript MRSCOM-2017-0188: „Green inorganic photoluminescence and electroluminescence from Mn doped Zn₂GeO₄ films“

Optical Express:

12. Manuscript 239926 (2015): „Directional solidification, thermo-mechanical and optical properties of $(Mg_xCa_{1-x})_3Al_2Si_3O_{12}$ glasses doped with Nd^{3+} ions“

Physics and Chemistry of Glasses:

13. Manuscript PCG-D-15-00008: „Blue emitting $YAl_3(BO_3)_4$: Tm^{3+} single-phase phosphors under UV excitation“
14. Manuscript PCG-D-15-00033: „EPR Studies of Strontium Alkali Borate Glasses Doped With Vanadium Ion“
15. Manuscript PCG-D-15-00061 – R1: „The influence of the modifier oxide on optical absorption and fluorescence properties of Sm^{3+} ion in LiF- B_2O_3 Glasses“

Journal of the American Ceramics Society:

16. Manuscript JACERS-44207: “Title: Effects of Y^{3+} on the enhancement NIR emission of Bi^{3+} - Er^{3+} co-doped in silicate glass-ceramics for optical amplifiers”
17. Manuscript JACERS-52403: „Effect of concentration of Er^{3+} on up-conversion luminescence in $NaYF_4$ containing oxy-fluoride glassceramics“
18. Manuscript JACERS-53069: „Title: $Gd_2Te_6O_{15}$ anti-glass phase-enhanced Er^{3+}/Yb^{3+} co-doped transparent tellurite glass-ceramics for up-conversion optical thermometry“

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ČESTNÉ PREHLÁSENIE

Prehlasujem, že údaje uvedené v tomto dokumente sú pravdivé.

Miesto	Dátum	Meno, priezvisko, titul (podpis)
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