Alexander ROSHAL

Curriculum vitae

- **Date and place of birth:** June 9, 1962; Kharkov, UKRAINE
- **Citizenship:** ukrainien
- **Marital status:** Married, 1 child
- **Personal site:** https://rochal.univer.kharkov.ua/

Academic degrees and titles:

- **M.Sc. in Physical Chemistry**, 1985, Department of Chemistry, Kharkov State University, UKRAINE. Supervisor - Prof. Dr. M. Zhedek. Title of thesis: Qualitative analysis of alfalfa phenolic compounds (isoflavones) by thin layer chromatography.
- **Ph.D. in Chemistry** (speciality - Organic Chemistry), 1993, Department of Chemistry, Kharkov State University, UKRAINE. Supervisor - Prof. Dr. V.D. Orlov. Title of dissertation: “Isoflavones: synthesis, acidic, basic and spectral properties"
- **Dr.hab. in Chemistry** (Docteur habilité en chimie, DSC), 1999, Laboratory IMRCP, Paul Sabatier University, Toulouse, FRANCE. Consultant - Prof. Armand Lattes. Title of dissertation: “Flavonoides non saturés : complexation et propriétés spectrales”.

- **186** papers (104 are indexed by Scopus)
- **25** patents
- **205** presentations at scientific conferences
- **8** scripts
- **18** handbooks and books of problems

Employment History for 10 last years:

- Beginning of the working experience in 1979
- **2007-2016** - Senior Researcher, Department of Physical Organic Chemistry, Research Institute of Chemistry, V.N. Karazin Kharkiv National University, Kharkiv, Ukraine.
- **2017-2021** Head of the Department of Physical Organic Chemistry, Research Institute of Chemistry, V.N. Karazin Kharkiv National University, Kharkiv, Ukraine.
- **2021 - by now** Acting Director of the Research Institute of Chemistry at V.N. Karazin Kharkiv National University, Kharkiv, Ukraine.

Pedagogical Activity for 10 last years:

- **2009-2016** - Invited Professor. Faculty of chemistry, University of Gdansk, Gdansk, Poland.
    - Course: "Photonics of molecules" (in Polish language) for PhD students.

- **2011-2018** - Associate Professor. Materials Chemistry Department, School of Chemistry, Kharkiv V.N. Karazin National University, Kharkiv, Ukraine.
    - Course: "Bioorganic Chemistry" (in English language) for 1st-year foreign students of the School of medicine,
    - Course: "Electronic spectroscopy" (in Ukrainian and Russian languages) for master (M1) students of the School of chemistry,

- **2016-2021** - Full Professor. Department of organic synthesis and nanotechnologies, School of organic Chemistry and Technology of Organic Compounds, Kharkiv Technical University "Kharkiv Polytechnic Institute", Kharkiv, Ukraine.
    - Course: "Physico-chemical bases of the analysis of biologically active compounds" (in Ukrainian language) for 5th-year students.

- **2018 - by now** - Full Professor. Materials Chemistry Department, School of Chemistry, Kharkiv V.N. Karazin National University, Kharkiv, Ukraine.
    - Course: "Polymer chemistry" (in Ukrainian and Russian languages) for 3rd-4th-year students of the Chemical Faculty,
    - Course: "Bioorganic Chemistry" (in English language) for 1st-year foreign students of the School of medicine,

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Supervising MSc and PhD students

During last 10 years, I was a supervisor of more than 30 student's scientific graduate works. I was a supervisor of 5 defended PhD dissertation works.

Titles of defended PhD dissertations:

- **Sakhno T.V.** *Complex formation and spectral properties of 3-hydroxychromone derivatives,* 2004.
- **Lvovska M.I.** *Electronic structure and spectral properties of 3-hetarylchromones,* 2006.
- **Moroz V.V.** *Protolytic equilibria and complex formation of diflavonol derivatives in the excited and ground states,* 2008.
- **Sanin E.V.** *Spectral properties of coumaroyl benzopyrylic salts: influence of interfragmental charge transfer and nucleophile solvation,* 2015.
- **Serdiuk I.E.** *Synthesis and physico-chemical properties of flavonols with alternative proton transfer,* 2016.

Postgraduate studies occuring now:

- **Khodzhaieva R.S.** *Spectral properties of formyl derivatives of flavones,* since 2019.
- **Mudrak V.A.** *Synthesis and spectral properties flavonoid-NO complexes of ruthenium,* since 2020.
- **Demidov O.O.** *Synthesis, prototropic equilibria and complexation of 4'-hydroxy flavonol derivatives,* since 2021.
- **Vashchenko O.V.** *Synthesis and characterisation of anisotropic polymers based on natural chromophores,* since 2022

Participation in scientific projects

- Design of high-efficiency luminophores and laser dyes for violet and ultra-violet spectral range. *Project of ministry of education and science of Ukraine N 01880038647* , 1.01.1992 - 30.12.1994, project director - prof. Ponomariov O.A. (my function is a ***project executor***).

- Development of database of fluorophores and laser dyes. *Project of ministry of education and science of Ukraine N 194U021414*. 1.01.1995 - 30.12.1997, project director - prof. Ponomariov O.A. (***project executor***).

- Photonics and intermolecular interactions of ionic organic luminophores. *Project of ministry of education and science of Ukraine N 0197U002449*. 1.01.1998 - 30.12.2000, project director - prof. Doroshenko A.O. (***project vice-director***).

- Photonics of luminophores with abnormally high Stokes shifts: fluorescent probes of a new type. *Project of ministry of education and science of Ukraine N 0199U004432*. 1.01.1998 - 30.12.2000, project director - prof. Doroshenko A.O. (***project vice-director***).

- Intramolecular hydrogen bonds and charge transfer in excited fluorophore molecules. *Project of ministry of education and science of Ukraine N 0101U002779*. 1.01.2001 - 30.12.2003, project director - prof. Doroshenko A.O. (***project vice-director***).

- New fluorescent probes and markers-conjugates for biological investigations. *Project of ministry of education and science of Ukraine N 0104U00659*. 1.01.2004 - 30.12.2006, project director - prof. Doroshenko A.O. (***project vice-director***).

- Polycyclic luminescent dyes for biological investigations. *Project of ministry of education and science of Ukraine N 0107U000662*. 1.01.2007 - 30.12.2009, project director - prof. Doroshenko A.O. (***project vice-director***).

- Design of multiplex analytical systems for environment polution testing and medical diagnostics using classification dyes. *Project of Ukrainian Scientific and Technical Centre N STCU#3795*. 1.08.2007 - 30.07.2009, project directors - Dr. Patsenker L.D. and Dr.hab. Roshal A.D. (***project director***).

- Systems with proton and charge transfer for development of sensor materials *Project of ministry of education and science of Ukraine N 0110U000582*. 1.01.2010 - 30.12.2012, project director - prof. Doroshenko A.O. (***project vice-director***).

- Chemosensors and nanometrials based on new organic fluorophores with proton photo transfer. *Project of ministry of education and science of Ukraine N 0110U000582*. 1.01.2013 - 30.12.2015, project director - prof. Doroshenko A.O. (***project vice-director***).

- The design of new spirocyclic systems containing condensed heterocyclic fragment. *Common project of ministeries of education and science of Ukraine and Russia (F53/92-2013) N 0113U002803*. 1.01.2013 - 30.12.2014, project director - prof. Doroshenko A.O. (***project vice-director***).

- A study of chemical composition, structure, formation and accumulation mechanisms of biogenes in some areas of the Argentine Islands and the surrounding areas. *Project of the National Antarctic scientific center of Ukraine (n/6-2013) N 0113U005817*, 1.08.2013 - 31.12.2013, project director - Dr.hab. Roshal A.D. (***project director***).

- New sensor systems and nanomaterials based on silica-organic hydrids with anchored fluorofors and electroactive layers. *Project of ministry of education and science of Ukraine N 0115U000484* . 1.01.2015 - 30.12.2017, project director - Prof. Kholin Yu.V. (***project executor***).

- New fluorescent sensor materials for multiparametric determination toxic heavy metals. *Project of ministry of education and science of Ukraine N 0116U000835* . 1.01.2016 - 30.12.2018, project director - Prof. Doroshenko A.O. (***project vice-director***).

- "Smart" ligands for selective determination of metal ions based on fluorophore systems with the proton phototransfer. *Project of ministry of education and science of Ukraine N* 0119U002536. 1.01.2019 - 30.12.2021, project director - Prof. Roshal A.D. (***project director***).

- Chromone-based fluorescent indicators for determination of β-glucosidase activity. *Project of National Research Foundation of Ukraine N 0120U105227 / 0121U112517*. 17.10.2020 - 31.12.2022, project director - Prof. Roshal A.D. (***project director***).

- Fluorescent heterocyclic ligangs for linling, analysis and accumulation of bivalent metals radioactive isotopes. *Project of ministry of education and science of Ukraine № 0122U001387*. 1.01.2022 - 31.12.2024, project director - Prof. Roshal A.D. (***project director***).

- Nanoparticles of noble metals functionalized by stimuli-sensitive ligands and fluorescent dyes for address-transportation and monitoring. *Project of ministry of education and science of Ukraine № 0122U001388*. 1.01.2022 - 31.12.2024, , project director - Prof. Kyrychenko O.V. (***project vice-director***).

Grants and awards

- **2021**. Winner of the XXIII regional competition "Higher School of the Kharkiv region - the best names" in the nomination "Scientist"
- **2002 - 2014.** Annual grants of the Ministry of education and science of Poland (Poland).
- **2007, 2010.** Grant of the Ministry of education and science of Spain (Spain).
- **2003.** The NATO grant (Belgium, Spain).
- **2001.** The grant of international Society "Goupe Polyphenols" (France).

- **1990.** The medal "Inventor of USSR" of the Society of rationalizers and inventors of the Soviet Union.

List of publications for 2017-2022

Articles

1. Mishurov D., Voronkin A., **Roshal A.,** Vashchenko O. Nonlinear activity and long-term stability of thin polymer films based on poly(3,5,7, 3',4'-pentahydroxyflavone-8-sulfonic acid) sodium salt // *Polymers and Polymer Composites*.- 2022.- V.30.- P. 1-8. DOI: 10.1177/09673911211072978 (VoS, SCOPUS, quartile 3)
2. Demidov O.O., Gladkov E.S., Kyrychenko A.V., **Roshal A.D.** Synthetic and Natural Flavonols as Promising Fluorescence Probes for β-Glucosidase Activity Screening // *Functional Materials*, 2022.- V.29, №2.- P.252-262 DOI: 10.15407/fm29.02.252 (SCOPUS, quartile 4)
3. Khodzhaieva R.S., Gladkov E.S., Kyrychenko A., **Roshal A.D.** Progress and achievements in glycosylation of flavonoids // *Front. Chem.*– 2021.– V. 9, № 133. Art.num. 637944, DOI: 10.3389/fchem.2021.637994 (VoS, SCOPUS, quartile 1)
4. Bezkrovnaya O.N., Babenko G.N., Pritula I.M., **Roshal A.D.**, Gurkalenko Y.A., Kozlovski A.A., Kostenyukova E. I. Composite materials based on SiO2-matrices saturated with DAST // *Journal of Non-Crystalline Solids*. – 2020. – Volume 535. – Art. no. 119957, DOI: 10.1016/j.jnoncrysol.2020.119957 (VoS, SCOPUS, quartile 1)
5. Mishurov D.A., Voronkin A.A., **Roshal O.D.** Hydroxyflavone-containing polymers: theoretical prediction of spectral and nonlinear optical properties // *Functional materials* –2019.–26 (1). - P.164-173, DOI: 10.15407/fm26.01.164 (SCOPUS, quartile 4)
6. Krzymiński K**., Roshal A.**, Rudnicki-Velasquez P., Żamojć K. On the use of acridinium indicators for the chemiluminescent determination of the total antioxidant capacity of dietary supplements // *Luminescence*.- 2019.- V.34, iss.5.- P.512-519. DOI: 10.1002/bio.3629 (SCOPUS, WoS, quartile 2)
7. Mchedlov-Petrossyan N.O., Cheipesh T.A., Shekhovtsov S.V., Ushakova E.V., **Roshal A.D.**, Omelchenko I.V. Aminofluoresceins vs fluorescein: Ascertained new unusual features of tautomerism and dissociation of hydroxyxanthene dyes in solution // *The Journal of Physical Chemistry A*.- 2019.- V.123, iss. 41.- P. 8845-8859, DOI: 10.1021/acs.jpca.7b05810 (SCOPUS, WoS, quartile 2)
8. Mchedlov-Petrossyan N.O., Cheipesh T.A., **Roshal A.D.**, Shekhovtsov S.V., Moskaeva E.G., Omelchenko I.V. Aminofluoresceins vs fluorescein: Peculiarities of fluorescence // *The Journal of Physical Chemistry A*.- 2019.- V.123, iss. 41.- P. 8860-8870, DOI: 10.1021/acs.jpca.7b05812 (SCOPUS, WoS, quartile 2)
9. Mishurov D., Voronkin A., **Roshal A.**, Bogatyrenko S., Vashchenko O. Synthesis and characterization of dye-doped polymer films for non-linear optical applications // *Chemistry & Chemical Technology*.- 2019.- V.13, iss. 4.- P. 459-464, DOI: 10.23939/chcht13.04 (SCOPUS, quartile 3)
10. Gorobchenko O.A., Glibitskiy D.M., Nikolov O.T., **Roshal A.D.,** Zibarov A.M., Shestopalova A., Semenov M.A., Glibitskiy G.M. Effect of gamma-irradiation of bovine serum albumin solution on the formation of zigzag film textures // *Radiation Physics and Chemistry*.- 2018.- V.144.- P.231-237, DOI: 10.1016/j.radphyschem.2017.08.019 (Web of Science, SCOPUS, quartile 2)
11. Serdiuk I.E., Wera M., **Roshal A.D.** Structural and Spectral Features of 4'-Substituted 2'-Hydroxychalcones in Solutions and Crystals: Spectroscopic and Theoretical Investigations // *The Journal of Physical Chemistry A*.- 2018.- V.122, N.39.- P. 2030-2038, DOI: 10.1021/acs.jpca.7b10361 (WoS, SCOPUS, quartile 2)
12. Ponomarev O.A., Sanin E.V., Chepeleva L.V., **Roshal A.D.** Electronic absorption spectra and fluorescent properties of non-associated 16,17-bis(alkoxy) violanthrone dyes and their dependence on the nature of substituent and solvent's parameters // *Dyes and Pigments*.- 2018.- V.156, N.1.- P. 45–52, DOI: 10.1016/j.dyepig.2018.03.068 (WoS, SCOPUS, quartile 1)

13. Serdiuk I.E., **Roshal A.D.** Exploring Double Proton Transfer: a Review on Photochemical Features of Compounds with Two Proton-Transfer Sites // *Dyes and Pigments*.- 2017.- V.138.- P.223–244, DOI: 10.1016/j.dyepig.2016.11.028 (ISI, SCOPUS, quartile 1)
14. Mishurov D.A., Voronkin A.A. **Roshal A.D.**, Bogatyrenko S.I. Influence of Structure 3,5,7,3',4'-Pentahydroxyflavone-Based Polymer Films on Their Optical Transparency // *Optical Materials*.- 2017.- V.64.- P.166–170, DOI: 10.1016/j.optmat.2016.12.004 (WoS, SCOPUS, quartile 2)
15. Kaliteevskaya E.N., Krutyakova V.P., Razumova T.K., **Roshal A.D.**, Starovoytov A.A. Optical properties and component composition of layers of cyanine dyes on dielectric supports: influence of asymmetry of the molecular electron density distribution // *Optics and Quantum Electronics*.-2017.- V.49, Iss.1.- P.32:1-8, DOI : 10.1007/s11082-016-0862-x (WoS, SCOPUS, quartile 2)
16. Mishurov D.A., **Roshal A.D.,** Brovko O.O. Influence of Residual Solvent on Relaxation Behavior of Polymer Films Based on Glycidyl Derivatives of 3,5,7, 3',4'-Pentahydroxyflavone // *Functional Materials*.-2017.- V.24, Iss.1.- P.68-75, DOI : 10.15407/fm24.01.068 (SCOPUS, quartile 4)
17. Iurchenko A.N., Voronov A.P., **Roshal A.D.,** Kryvonogova S.I., Babenko G.N., Pritula I.M. Growth peculiarities of doped lithium dihydrogen phosphate single crystals from non-stoichiometric solution // *Functional Materials*.-2017.- V.24, Iss.1.- P.226-236, DOI : 10.15407/fm24.01.226 (SCOPUS, quartile 4)

Patents

1. Synthesis of derivatives of 2-(3,4-dihydroxyphenyl)-3-hydroxy-4H-chromen-4-ones. Gladkov Y.S., Demidov O.O., Manvelian A.A. **Roshal A.D.,** *Patent UA,* 150472, C07D311/32.- 2021.- publ. bul. 8/2022.

2. N-Substituted derivatives of 2-methyl-4-aryl-8-aryliden-5,6,7,8-tetrahydroxyquinazolines and the method of their synthesis. Gladkov Y.S., Snizhko A.D**., Roshal A.D.,** *Patent UA, #124608*, C07D239/74, A61K31/517, prior. 14.10.2021, publ. bul. №41, 11.09.2021, 11 p.

3. Polymer composite material. Mishurov D.A., Avramenko V.L., **Roshal A.D.**, Voronkin A.A., *Patent UA 119395*, C08K 5/13, prior. 06.11.2017, published 10.06.2019, 34 p.

4. Viscosity-sensitive dyes and method. Shkand T.V., Chizh M.A., Sleta I.V., Tatarets A.L., **Roshal O.D.,** Patsenker L.D., Sandomirski B.P., Terpetschnig A.E., *Patent USA 009841428 B2*, G01N 33/582, G01N 33/52, G01N 21/6408, G01N 21/6456, G01N 2021/6439, прuор. 12.12.2017, 34 p.

5. Method to increase the diminished reproductive potential of males. Karpenko N.A., Chystiakova E.Ye., Koreneva Ye.M., Smolenko N.P., **Roshal A.D.,** Vakula V.M., Sova O.M., Svidlo I.M., Yaremenko F.G. *Patent 111945 UA*, A61K 31/16 , C07D 277/00, A61P 15/00, prior. 25.11.2016, published in bull. 22/2016, 7 p.

6. Polymer material. Mishurov D.A., Avramenko V.L., **Roshal A.D.,** Voronkin A.A., Moroz V.V. *Patent 115611 UA*, published in bull. 22/2017, 11 p.

Monographs

1. **Roshal A.D.** Bases of the photonics. Electronic absorption spectroscopy. 2019, Kharkiv, Publishing house of Kharkiv National University, 236 p.
2. Shapovalov S.A., **Roshal A.D.** Functionalized photometric and fluorimetric reagents in actual chemical analysis of metals and boron derivatives (ukr). **2021**, Kharkiv: Edition of V.N. Karazin Kharkiv National University, 236 p.