



Școala Doctorală de Chimie

Nr. 474/5.04.2022

TEMATICA PENTRU CONCURSUL DE ADMITERE LA DOCTORAT sesiunea septembrie 2022

Prof. univ. dr. habil. Cecilia ARSENE

1. Aerosoli atmosferici generați prin arderea biomasei și a biocombustibililor. Caracterizare fizico-chimică și reactivitate în condiții atmosferice reale și simulate (ro)

Atmospheric aerosols from biomass and biofuels burning. Physico-chemical characterization and reactivity under real and simulated atmospheric conditions (en)

Bibliografie/References

1. Al-Abadleh, H.A., Aging of atmospheric aerosols and the role of iron in catalysing brown carbon formation, *Environmental Science: Atmosphere*, 1, 298-345, **2021**
2. Hems, R.F., Schnitzler, E.G., Liu-Kang, C., Cappa, C.D., Abbatt, J.P.D., Aging of atmospheric brown carbon aerosol, *ACS Earth Space Chemistry*, 5, 722-748, **2021**.
3. Jo, D.S., Park, R.S., Lee, S., Kim, S.W., Zhang, X., A global simulation of brown carbon: implications for photochemistry and direct radiative effect, *Atmospheric Chemistry and Physics*, 16, 3413-3432, **2016**.
4. Laskin, A., Laskin, J., Nizkorodov, S.A., Chemistry of atmospheric brown carbon, *Chemical Reviews*, 115, 4335-4382, **2015**.
5. Liu-Kang, C., Gallimore, P.J., Liu, T., Abbatt, J.P.D., Photoreaction of biomass burning brown carbon aerosol particles, *Environmental Science: Atmosphere*, 2, 270-277, **2022**.

2. Hidrocarburi aromatice policiclice și derivați ai acestora în atmosfera zonei urbane Iași, nord-estul României. Atribuirea surselor și estimarea riscurilor asupra sănătății umane (ro)

Polycyclic aromatic hydrocarbons (PAHs) and their derivatives in the atmosphere of the Iasi urban area, north-eastern Romania: Sources apportionment and health risk assessments (en)

Bibliografie/References

1. Lv, Y., Li, X., Xu, T.T., Cheng, T.T., Yang, X., Chen, J.M., Iinuma, Y., Herrmann, H., Size distributions of polycyclic aromatic hydrocarbons in urban atmosphere: sorption mechanism and source contributions to respiratory deposition, *Atmospheric Chemistry and Physics*, 16, 2971-2983, **2016**.
2. Maceira, A., Marce, R.M., Borrull, F., Analytical methods for determining organic compounds present in the particulate matter from outdoor air, *Trends in Analytical Chemistry*, 122, 115707, **2020**.
3. Olariu, R.I., Vione, D., Grinberg, N., Arsene, C., Sample preparation for trace analysis by chromatographic methods, *Journal of Liquid Chromatography & Related Technologies*, 33, 1174-1207, **2010**.
4. Singh, R., Yadav, A., Chopra, A., Christopher, J., Kapur, G.S., Comparison of five different HPLC columns with different particle sizes, lengths and make for the optimization of seven polycyclic aromatic hydrocarbons (PAH) analysis, *Springer Nature Applied Sciences*, 1, 313, **2019**.



- Song, W., Cao, F., Lin, Y.C., Haque, M., Wu, X., Zhang, Y., Zhang, C., Xie, F., Zhang, Y.L., Extremely high abundance of polycyclic aromatic hydrocarbons in aerosols from a typical coal-combustion rural site in China: Size distribution, source identification and cancer risk assessment, *Atmospheric Research*, 248, 105192, 2021.

Prof. univ. dr. Elena BÎCU

1. Noi compuși azaheterociclici penta- și hexa-atomici. Sinteze și aplicații (ro)

New penta- and hexa-atomic azaheterocyclic compounds. Syntheses and applications (en)

Bibliografie/References

- Moise, I.M., Bicu, E., Farce, A., Dubois, J., Ghinet, A., Indolizine-phenothiazine hybrids as the first dual inhibitors of tubulin polymerization and farnesyl transferase with synergistic antitumor activity, *Bioorganic Chemistry*, 103, 104184, 2020;
- Makhaeva, G.F., Lushchekina, N.P., Boltneva, S.V., Novel potent bifunctional carboxylesterase inhibitors based on a polyfluoroalkyl-2-imino-1,3-dione scaffold, *European Journal of Medicinal Chemistry*, 218, 113385, 2021;
- Metwally, N.H., Radwan, I.T., El-Serwy, W.S., Mohamed, M.A., Design, synthesis, DNA assessment and molecular docking study of novel 2(pyridin-2-ylimino) thiazolidin-4-one derivatives as potent antifungal agents, *Bioorganic Chemistry*, 84, 456–467, 2019;
- Metwally, N.H., Mohamed, M.S., AliRagb, E., Design, synthesis, anticancer evaluation, molecular docking and cell cycle analysis of 3-methyl-4,7-dihydropyrazolo [1,5-a]pyrimidine derivatives as potent histonelysin demethylases (KDM) inhibitors and apoptosis inducers, *Bioorganic Chemistry*, 88, 102929, 2019;
- Morak-Mlodawska, B., Pluta, K., Latocha, M., Jelen, M., Kusmierz, D., Synthesis, Anticancer Activity, and Apoptosis Induction of Novel 3,6-Diazaphenothiazines, *Molecules*, 24, 267, 2019;
- Zhuang, C., Zhang, W., Sheng, C., Zhang, W., Xing, C., Miao, Z., Chalcone: A Privileged Structure in Medicinal Chemistry, *Chem. Rev.*, 117, 7762–7810, 2017.

2. Noi derivați 1,2,3-triazolici. Sinteze și aplicații (ro)

New 1,2,3-triazole derivatives. Syntheses and applications (en)

Bibliografie/References

- Lal, S., Diez-Gonzalez, S., [CuBr(PPh₃)₃] for Azide-Alkyne Cycloaddition Reactions under strict click conditions, *The Journal of the Organic Chemistry*, 76, 2367-2373, 2011, DOI:10.1021/jo200085j
- Lalitha, K., Muthusamy, K., Siva Prasad, Y., Vemula, P.K., Nagarajan, S., Recent developments in β-C-glycosides: Synthesis and applications, *Carbohydrate Research*, 402, 158-171, 2015, DOI:10.1016/j.carres.2014.10.008
- He, X.P., Zeng, Y.L., Zang, Y., Li, J., Field, R.A., Chen, G.R., Carbohydrate CuAAC click chemistry for therapy and diagnosis, *Carbohydrate Research*, 429, 1-22, 2016, DOI: 10.1016/j.carres.2016.03.022
- Bozorova, K., Zhaoa, J., Aisaa, H.A., 1,2,3-Triazole-containing hybrids as leads in medicinal chemistry: A recent overview, *Bioorganic & Medicinal Chemistry*, 27 (16), 3511-3531, 2019, DOI: doi.org/10.1016/j.bmc.2019.07.005
- Sutcharitruk, W., Sirion, U., Saeeng, R., One-pot synthesis of substituted-amino triazole-glycosides, *Carbohydrate Research*, 484, 107780, 2019, DOI: 10.1016/j.carres.2019.107780
- Nemallapudi, B.R., Guda, D.R., Ummadi, N., Avula, B., Zyryanov, G.V., Reddy, C.S., Gundala, S.M., New Methods for Synthesis of 1,2,3-Triazoles: A Review, *Polycyclic Aromatic Compounds*, 2021, DOI: 10.1080/10406638.2020.1866038.



Prof. univ. dr. Gabi DROCHIOIU

1. Dinitrofenoli-bioenergetică și aplicații biomedicale (ro) *Dinitrophenols – Bioenergetics and biomedical applications (en)*

Bibliografie/References

1. Airinei, A., Nicolescu, A., Drochioiu, G., Rusu, E., Jurcoane, S., Rusu, G., Dinitrophenols-from Chemistry to Life and Health. PIM Publ. House, Iasi, **2010**.
2. Ali, A., Akhter, M. A., Haneef, K., Khan, I., Naeem, N., Habib, R., Salim, A. Dinitrophenol modulates gene expression levels of angiogenic, cell survival and cardiomyogenic factors in bone marrow derived mesenchymal stem cells, *Gene*, 555(2), 448-457, **2015**.
3. Devlin, M., Textbook of biochemistry, John Willey and Sons, New York, Chichester, Brisbane, Toronto, Singapore, **1986**.
4. Grabe, M., Natale, A.M., Bertholet, A.M., Bisignano, P., Kirichok, Y.V., Suzuki, J. Mitochondrial uncouplers induce proton leak by activating AAC and UCPI, *Biophysical Journal*, 121(3), 513a, **2022**.
5. Lehninger A. L. Biochimie, vol. I și II, Edit. Tehnică, București, **1992**.

Prof. univ. dr. Ionel MANGALAGIU

1. Compuși hibridi azaheterociclici cu potențiale aplicații practice (ro) *Hybrid azaheterocyclic compounds with potential practical applications (en)*

Bibliografie/References

1. Antoci, V., Cucu, D., Zbancioc, Ghe., Moldoveanu, C., Mangalagiu, V., Amariuca-Mantu, D., Aricu, A., Mangalagiu, I.I., Bis-(imidazole/benzimidazole)-pyridine derivatives: synthesis, structure and antimycobacterial activity. Part XII, *Future Medicinal Chemistry*, 12, 207-222, **2020**.
2. Olaru, A., Vasilache, V., Danac, R., Mangalagiu I.I., Antimycobacterial activity of nitrogen heterocycles derivatives: 7-(pyridine-4-yl)- indolizine derivatives. Part VII, *Journal of Enzyme Inhibition and Medicinal Chemistry*, 32, 1291-1298, **2017**.
3. Mantu, D., Antoci, V., Moldoveanu, C., Zbancioc, Ghe., Mangalagiu, I.I., Hybrid imidazole (benzimidazole) / pyridine (quinoline) derivatives and evaluation of their anticancer and antimycobacterial activity, *Journal of Enzyme Inhibition And Medicinal Chemistry*, 31, 96-103, **2016**.
4. Mantu, D., Antoci, V., Nicolescu, A., Deleanu, C., Vasilache, V., Mangalagiu, I.I., Synthesis, stereochemical studies and antimycobacterial activity of new acetylhydrazines pyridazinone, *Current Organic Synthesis*, 14, 112-119, **2017**.
5. Zbancioc, Ghe., Zbancioc, A.M., Mangalagiu, I.I., Ultrasound and microwave assisted synthesis of dihydroxyacetophenone derivatives with or without 1,2-diazine skeleton, *Ultrasonics Sonochemistry*, 21, 802-811, **2014**.
6. Kuchkova, K., Aricu, A., Barba, A., Vlad, P., Shova, S., Secara, E., Ungur, N., Zbancioc, Ghe., Mangalagiu, I.I., An efficient and straightforward method to new homodrimane sesquiterpenoids with diazine units, *Synlett*, 24, 697-700, **2013**.
7. Mantu, D., Luca, M.C., Moldoveanu, C., Zbancioc, Ghe., Mangalagiu I.I., Synthesis and antituberculosis activity of some new pyridazine derivatives, Part II, *Eur. J. Med. Chem.*, 45, 5164-5168, **2010**.



Prof. univ. dr. habil. Romeo-Iulian OLARIU

1. **Studiul degradării atmosferice a unor solvenți organici curați (ro)**
Study of the atmospheric degradation of selected clean organic solvents (en)

Bibliografie/references

1. Byrne, F. P., Forier, B., Bossaert, G., Hoebbers, C., Farmer, T.J., Hunt, A.J., A methodical selection process for the development of ketones and esters as bio-based replacements for traditional hydrocarbon solvents. *Green Chemistry*, 20, 4003–4011, **2018**.
2. Finlayson-Pitts, B. J.; Pitts, N. J., Jr. *Chemistry of the Upper and Lower Atmosphere*; Academic Press: San Diego, CA, **2000**.
3. Alder, C.M., Hayler, J.D., Henderson, R.K., Redman, A.M., Shukla, L., Shuster, L.E., Sneddon, H.F., Updating and further expanding GSK's solvent sustainability guide, *Green Chemistry*, 18, 3879–3890, **2016**.

Prof. univ. dr. Aurel PUI

1. **Nanostructuri oxidice cu aplicații biomedicale și în tratarea apelor (ro)**
Oxide nanostructures with biomedical and water treatment applications (en)

Bibliografie

1. Kefeni, K. K., Msagati, T.A., Nkambule, T.T., Mamba, B.B., Spinel ferrite nanoparticles and nanocomposites for biomedical applications and their toxicity, *Materials Science and Engineering: C*, 107, 110314, **2020**.
2. Kefeni, K.K., Mamba, B.B., Msagati, T.A., Application of spinel ferrite nanoparticles in water and wastewater treatment: a review, *Separation and Purification Technology*, 188, 399-422, **2017**.
3. Sharma, S.K., Javed, Y. (Eds.), *Magnetic nanoheterostructures: diagnostic, imaging and treatment*, Springer Nature, **2020**.
4. El-Naggar, M.E., Shoueir, K., Recent advances in polymer/metal/metal oxide hybrid nanostructures for catalytic applications: A review, *Journal of Environmental Chemical Engineering*, 8(5), 104175, **2020**.
5. Ikram, M., Rashid, M., Haider, A., Naz, S., Haider, J., Raza, A., Maqbool, M., A review of photocatalytic characterization, and environmental cleaning, of metal oxide nanostructured materials, *Sustainable Materials and Technologies*, 30, e00343, **2021**.
6. McBain, S.C., Yiu, H. HP., Yiu, Dobson, J., Magnetic nanoparticles for gene and drug delivery, *International Journal of Nanomedicine*, 169-180, **2008**.

2. **Corelația structură-proprietăți în seria unor oxizi metalici micști (ro)**
The correlation between structure and properties in the mixed metal oxides series (en)

Bibliografie

1. Assis, G.C., Silva, I.M.A., Dos Santos, T.V., Meneghetti, M.R., Meneghetti, S.M.P., Photocatalytic properties of SnO₂/MoO₃ mixed oxides and their relation to the electronic properties and surface acidity, *Journal of Photochemistry & Photobiology, A: Chemistry*, 407, 113035, **2021**, <https://doi.org/10.1016/j.jphotochem.2020.113035>;



- Gonell, F., Sanchez-Sanchez, C.M., Vivier, V., Methivier, C., Laberty-Robert, C., Portehault, D., Structure–activity relationship in manganese perovskite oxide nanocrystals from molten salts for efficient oxygen reduction reaction electrocatalysis, *Chemistry of Materials*, 32, 4241–4247, 2020, <https://dx.doi.org/10.1021/acs.chemmater.0c00681>;
- Jacobs, R., Hwang, J., Shao-Horn, Y., Morgan, D., Assessing Correlations of Perovskite catalytic performance with electronic structure descriptors, *Chemistry of Materials*, 31, 785–797, 2019, DOI: 10.1021/acs.chemmater.8b03840;
- Sun, Y., Liao, H., Wang, J., Chen, B., Sun, S., Hoong Ong, S.J., Xi, S., Diao, C., Du, C., Du, Y., Wnag, J.O., Breese, M.B.H., Li, S., Zhang, H., Xu, Z.J., Covalency competition dominates the water oxidation structure–activity relationship on spinel oxides, *Nature Catalysis*, 3, 554–563, 2020, <https://doi.org/10.1038/s41929-020-0465-6>;
- Wang, Y., Wang, G., Deng, W., Han, J., Qin, L., Zhao, B., Guo, L., Xing, F., Study on the structure-activity relationship of Fe-Mn oxide catalysts for chlorobenzene catalytic combustion, *Chemical Engineering Journal*, 395, 125172, 2020, <https://doi.org/10.1016/j.cej.2020.125172>.

3. Sinteza și caracterizarea unor silicați ai lantanidelor (ro)

Synthesis and characterization of some lanthanide silicates (en)

Bibliografie

- F. Rey-García, N. Ben Sedrine, M. R. Soares, A. J. S. Fernandes, A. B. Lopes, N. M. Ferreira, T. Onteiro, And F. M. Costa, Structural and optical characterization of Gd_2SiO_5 crystalline fibres obtained by laser floating zone, *Optical materials express*, 868, 7, 3, 2017.
- S.N. Ogugua, S.K.K. Shaat, H.C. Swart, O.M. Ntwaeaborwa, Optical properties and chemical composition analyses of mixed rare earth oxyorthosilicate (R_2SiO_5 , R 1/4 La, Gd and Y) doped Dyphosphors prepared by urea-assisted solution combustion method *Journal of Physics and Chemistry of Solids*, 83, 109–116, 2015.
- Monica Ciomaga Hatnean, Oleg A. Petrenko, Martin R. Lees, Tom E. Orton, and Geetha Balakrishnan, Optical Floating Zone Crystal Growth of Rare-Earth Disilicates, $R_2Si_2O_7$ (R = Er, Ho, and Tm), *Cryst. Growth Des.*, 20, 6636–6648 2020.
- Jianguo Wang, Shujian Tian, Guobao Li, Fuhui Liao, Xiping Jin, Preparation and X-Ray characterisation of low -temperature phases of R_2SiO_5 (R=rare earth elements), *Materials Research Bulletin*, 36, 1855–1861, 2001.
- J. Felsche, The crystal Chemistry of the Rare-Earth Silicates, Institut fur Kristallographie, ETH Zurich Switzerland, 1973.

DIRECTOR ȘCOALĂ DOCTORALĂ,

Prof. univ. dr. habil. Cecilia ARSENE