Eva Raudonytė-Svirbutavičienė

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The title of the lecture (23.05.2023, godzina 11.15, sala 151B INB UMCS):
Marine pollution and functional inorganic materials for environmental applications
Duration of the lecture – 45 min.

Short biography

Scientific interests

- Organic geochemistry.
- Spatial and seasonal distribution of inorganic and organic pollutants in biotic and abiotic medias and their effects on the ecosystems.
- Synthesis and investigation of functional inorganic materials.

Education

2018	Ph.D. in Chemistry, Vilnius University – Vilnius, Lithuania.
2013	M.Sc. in Chemistry, Vilnius University – Vilnius, Lithuania.
2011	B.Sc. in Chemistry, Vilnius University – Vilnius, Lithuania.

Employment history

07/2021 – present **Chief Researcher (Post-doc)**
Institute of Chemistry, Vilnius University – Vilnius, Lithuania.
01/2021 – present **Senior Researcher**
Nature Research Center, Laboratory of GeoenvironmentalResearch– Vilnius, Lithuania.
01/2018 – 01/2021 **Researcher**
Nature Research Center, Laboratory of GeoenvironmentalResearch– Vilnius, Lithuania.
06/2012 – 01/2018 **Engineer**
Nature Research Center, Laboratory of GeoenvironmentalResearch– Vilnius, Lithuania.

Scientific internships

1. Kyoto University, Japan (2023)
2. Masaryk University, Czech Respublic (2023)
3. University of Artois, France (2017)
4. University of Padova, Italy (2017)
5. Stockholm University, Sweden (2016)

Summary

Dr. Eva Raudonytė-Svirbutavičienė received her Ph.D. in Chemistry in 2018. She is currently doing her post-doc research project in Vilnius University, Institute of Chemistry. She is also a senior researcher in the Laboratory of Geoenvironmental Research of the Nature Research Center where she has been working since 2012. Her scientific interests include synthesis and analysis of functional inorganic materials, their application for treatment of the environment, organic geochemistry, determination of pollutants in various environmental objects, seasonal and spatial changes in the distribution, dispersion and accumulation of nutrients and pollutants in water bodies and terrestrial objects.

About the presentation

The lecture will provide a concise overview of research on environmental pollution, focusing on key issues such as tributyltin pollution in port environments and at sea, pollution resulting from environmental disasters, the potential impact of pollution on biota, and the urgent need for international regulations.

The second part of the presentation will cover synthesis and characterization of different functional inorganic materials that could be applied for the treatment of contaminated water.

First, a two-step photochemical synthesis of ceria-silver nanoheterostructures with ceria nanoparticles serving both as a photoactive material and a metal nanoparticle support. Silver nanoparticle size, shape, and oxidation state depend on concentration of the silver precursor, irradiation time, and the presence of radical/hole scavenger. Ag-CeO_2 nanoheterostructures showed significantly enhanced photocatalytic activity if compared to pure ceria NPs. The synthesized semiconductor-plasmonic nanoparticles could be successfully applied for photocatalysis.

Lastly, hydrothermal synthesis of highly oriented calcium-deficient hydroxyapatite using various metal ions (Mn^{2+}, Mg^{2+}, Ba^{2+}, Sr^{2+}) as controlling agents will be presented. By applying different synthesis conditions, doped CDHAp of different morphologies with preferentially exposed a,b- or c-planes were obtained. We expect that, depending on their orientation, the obtained HAp structures would demonstrate exceptional efficiency in remediation of anionic or cationic pollutants due to their specific adsorption sites. It is known that the a,b-plane of HAp is rich in calcium ions and is positively charged, while the c-plane is negatively charged due to phosphate and hydroxide ions [3]. Thus, fabricated materials with preferably oriented planes could provide the advantage of selective adsorption of anionic (exposed a, b- planes) or cationic (exposed c-planes) pollutants, such as dyes or antibiotics.

PUBLICATIONS

Scietific articles published in journals (books), indexed in „Clarivate Analytics Web of Science“ database (with citation index):

1. **Raudonytė-Svirbutavičienė, E.**, Jokšas, K., Stakėnienė, R. On the effectiveness of tributyltin ban part II: Temporal and spatial trends of organotin pollution in intense sediment accumulation areas and dumping sites of the Baltic Sea, *Journal of Hazardous Materials Advances* 10 (2023), 100294.
2. Karalkeviciene, R.; **Raudonyte-Svirbutaviciene, E**.; Zarkov, A.; Yang, J.-C.; Popov, A.I.; Kareiva, A. Solvothermal Synthesis of Calcium Hydroxyapatite via Hydrolysis of Alpha-Tricalcium Phosphate in the Presence of Different Organic Additives. *Crystals* 13, **(2023)**, 265.
3. D. Griesiute, **E. Raudonyte-Svirbutaviciene**, A. Kareiva, **A. Zarkov**, The influence of annealing conditions on the Ca/P ratio and phase transformations in bulk calcium phosphates, *CrystEngComm* 24(6) **(2022)** 1166-1170.
4. R. Karalkeviciene, **E. Raudonyte-Svirbutaviciene**, J. Gaidukevic, A. Zarkov, A. Kareiva, Solvothermal Synthesis of Calcium-Deficient Hydroxyapatite via Hydrolysis of α-Tricalcium Phosphate in Different Aqueous-Organic Media, *Crystals* 12(2) **(2022)** 253.
5. **E. Raudonytė-Svirbutavičienė**, R. Stakėnienė, K. Jokšas, D. Valiulis, S. Byčenkienė, A. Žarkov, Distribution of polycyclic aromatic hydrocarbons and heavy metals in soil following a large tire fire incident: A case study, *Chemosphere* 286 (1) **(2022)** 131556.
6. A. Ranjbar Jafarabadi, M. Dashtbozorg; **E. Raudonytė-Svirbutavičienė**; A. Riyahi Bakhtiari, A potential threat to the coral reef environments: polybrominated diphenyl ethers and phthalate esters in the corals and their ambient environment (Larak Island, Persian Gulf, Iran), *Science of The Total Environment* 775 **(2021)** 145822.
7. A. Ranjbar Jafarabadi, M. Dashtbozorg **E. Raudonytė-Svirbutavičienė**, A. Riyahi Bakhtiari, Chlorinated paraffins (SCCPs and MCCPs) in corals and water-SPM-sediment system in the Persian Gulf, Iran: A potential global threat for coral reefs, *Environmental Pollution* 275 **(2021)** 116531.
8. A. Ranjbar Jafarabadi, **E. Raudonytė-Svirbutavičienė**, A. Riyahi Bakhtiari, A. Kareiva, Polycyclic Aromatic Hydrocarbons (PAHs) in corals and their ambient environment: the role of suspended particulate matter, mucus and positive matrix factorization model for identifying contributions to carcinogenicity of PAHs sources, *Science of The Total Environment* 787 **(2021)** 147688.
9. A. Ranjbar Jafarabadi, **E. Raudonytė-Svirbutavičienė**, A. Shadmehri Toosi, A. Riyahi Bakhtiari, Positive Matrix Factorization receptor model and dynamics in fingerprinting of Potentially Toxic Metals in coastal ecosystem sediments at a large scale (Persian Gulf, Iran), *Water Research* 188 **(2021)** 116509.
10. **E. Raudonytė-Svirbutavičienė**, R. Stakėnienė, I. Baužienė, K. Jokšas, Polycyclic aromatic hydrocarbons in various Lithuanian water bodies and a positive matrix factorization-based identification of pollution sources, *Baltica* 34(1) **(2021)** 17-26.
11. **E. Raudonytė-Svirbutavičienė,** R. Stakėnienė, K. Jokšas, I. Matulaitienė, L. Mikoliūnaitė, A. Žarkov, A. Kareiva, On the microplastic pollution in the sandy beaches of Šventoji, Lithuania, *Baltica* 34 (1) **(2021)** 47-57.
12. L. Sinusaite; A. Popov; **E. Raudonyte-Svirbutaviciene**; J. Chang Yang; A. Kareiva; A. Zarkov, Effect of Mn doping on hydrolysis of low-temperature synthesized metastable alpha-tricalcium phosphate, *Ceramics International* 47 (9) **(2021)** 12078-12083.
13. M. Stankevičiūtė, T. Makaras, J. Pažusienė, B. Čapukoitienė, G. Sauliutė, Ž. Jurgelėnė, **E. Raudonytė-Svirbutavičienė**, K. Jokšas, Biological effects of multimetal (Ni, Cd, Pb, Cu, Cr, Zn) mixture in rainbow trout Oncorhynchus mykiss: laboratory exposure and recovery study, *Ecotoxicology and Environmental Safety* 216 **(2021)** 112202.
14. E. Grazenaite, E. Garskaite, Z. Stankeviciute, **E. Raudonyte-Svirbutaviciene**, A.Zarkov, A. Kareiva, Ga-Substituted Cobalt-Chromium Spinels as Ceramic Pigments Produced by Sol–Gel Synthesis, *Crystals* 10(12) **(2020)** 1078.
15. D. Karoblis, R. Diliautas, **E. Raudonyte-Svirbutaviciene**, K. Mazeika, D. Baltrunas, A. Beganskiene, A. Zarkov, A. Kareiva, The synthesis and characterization of sol-gel-derived $SrTiO_3$-$BiMnO_3$ solid solutions, *Crystals* 2020, 10(12) **(2020)** 1125

16. T. Makaras, D. Montvydienė, N. Kazlauskienė, M. Stankevičiūtė, **E. Raudonytė-Svirbutavičienė**, Juvenile fish responses to sublethal leachate concentrations: comparison of sensitivity of different behavioral endpoints, *Environmental Science and Pollution Research*, 27 **(2020)** 4876–4890.
17. A. Ranjbar Jafarabadi, M. Dashtbozorg, **E. Raudonytė-Svirbutavičienė**, A. Riyahi Bakhtiari, Biomonitoring of perylene in symbiotic reef and non-reef building corals and species-specific responses in the Kharg and Larak coral reefs (Persian Gulf, Iran): Bioaccumulation and source identification, *Environmental Pollution* 267 **(2020)** 115476.
18. A. Ranjbar Jafarabadi, M. Dashtbozorg, **E. Raudonytė-Svirbutavičienė**, A. Riyahi Bakhtiari, First report on polybrominated diphenyl ethers in the Iranian Coral Islands: Concentrations, profiles, source apportionment, and ecological risk assessment, *Chemosphere* 251 **(2020)** 126397.
19. A. Ranjbar Jafarabadi, S. Mitra, E. Raudonytė-Svirbutavičienė, A. Riyahi Bakhtiari, Large-scale evaluation of deposition, bioavailability and ecological risks of the potentially toxic metals in the sediment cores of the hotspot coral reef ecosystems (Persian Gulf, Iran), *Journal of Hazardous Materials* 400 **(2020)** 122988.
20. K. Jokšas, R. Stakėnienė, **E. Raudonytė-Svirbutavičienė,** On the effectiveness of tributyltin ban: Distribution and changes in butyltin concentrations over a 9-year period in Klaipėda Port, Lithuania, *Ecotoxicology and Environmental Safety* 183 **(2019)** 109515.
21. R. Stakėnienė, K. Jokšas, A. Galkus, **E. Raudonytė-Svirbutavičienė**, Polycyclic aromatic hydrocarbons in surface sediments from the Curonian Lagoon and the Nemunas River Delta (Lithuania, Baltic Sea): distribution, origin, and suggestions for the monitoring program, *Environmental Monitoring and Assessment* 191 (4) **(2019)** 191–212.
22. R. Stakėnienė, K. Jokšas, R. Zinkutė, **E. Raudonytė-Svirbutavičienė**, Oil pollution and geochemical hydrocarbon origin markers in sediments of the Curonian Lagoon and the Nemunas River Delta, *Baltica* 32 (1) **(2019)** 22–32.
23. **E. Raudonyte-Svirbutaviciene**, A. Neagu, V. Vickackaite, V. Jasulaitiene, A. Zarkov, C.W. Tai, A. Katelnikovas, Two-step photochemical inorganic approach to the synthesis of Ag-CeO_2 nanoheterostructures and their photocatalytic activity on tributyltin degradation, *Journal of Photochemistry and Photobiology A: Chemistry* 351 **(2018)** 29-41.
24. I. Mikalauskaitė, **E. Raudonytė-Svirbutavičienė**, A. Linkevičiūtė, M. Urbonas, A. Katelnikovas, Luminescence and luminescence quenching of $Sr_3Lu_2(Si_3O_9)_2$: Ce^{3+} phosphors, *Journal of Luminescence* 184 **(2017)** 185–190.
25. **E. Raudonyte-Svirbutaviciene**, L. Mikoliunaite, Audrius Drabavicius, R. Juskenas, S. Sakirzanovas, T. Jüstel, A. Katelnikovas, Photochemical synthesis of CeO_2 nanoscale particles using sodium azide as a photoactive material: effects of the annealing temperature and polyvinylpyrrolidone addition, *RSC Advances* 6 **(2016)** 107065.
26. R. Stakėnienė, K. Jokšas, A. Galkus, **E. Raudonytė-Svirbutavičienė,** Aliphatic and polycyclic aromatic hydrocarbons in the bottom sediments from Klaipėda Harbour, Lithuania (Baltic Sea), *Chemistry and Ecology* 32 **(2016)** 357–377.
27. **E. Raudonytė-Svirbutavičienė**, H. Bettentrup, D. Uhlich, S. Šakirzanovas, O.Opuchovič, S. Tautkus, A. Katelnikovas, On the $Ce^{3+} \rightarrow Cr^{3+}$ energy transfer in $Lu_3Al_5O_{12}$ garnets, *Optical Materials* 37 **(2014)** 204–210.