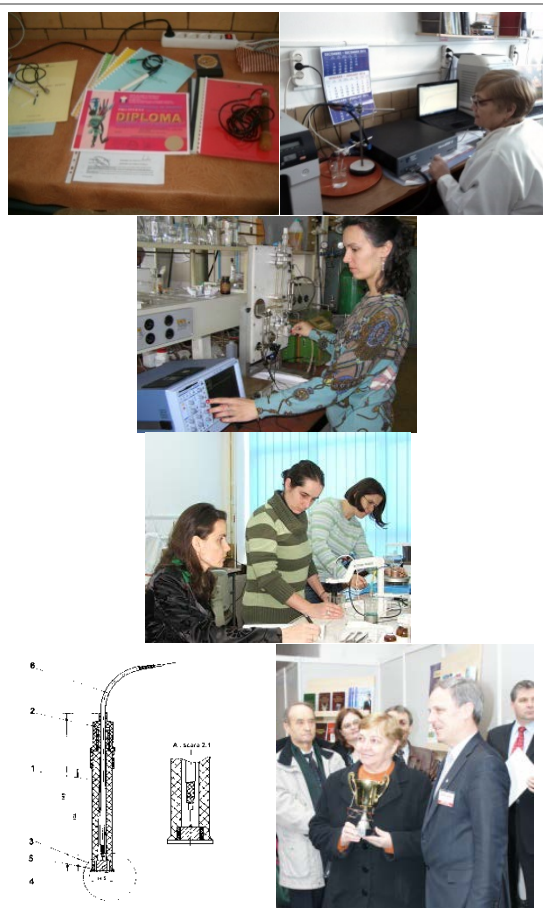


LABORATORY OF ELECTROCHEMISTRY IN ADVANCED MATERIALS

Contact details

| | |
|--------------------|---|
| Name | Laboratory of Electrochemistry in Advanced Materials |
| Acronym | ELMA |
| Logo | |
| Site | http://chimie.utcluj.ro/elma |
| Address | 103-105 Muncii Blv., Room: C 411 A, 400641, Cluj-Napoca, Romania |
| Faculty Department | Faculty of Materials and Environmental Engineering Physics and Chemistry Department |
| Telephone | +40 264 202799 |
| Fax | +40 264 415054 |
| Director | Prof. Dr. Chem. Elena Maria Pică |
| e-mail | empica@yahoo.com , elena.pica@chem.utcluj.ro |



Areas of expertise

Achievement of some electrochemical sensors.
 Synthesis of some advanced materials used for achievement of membrane sensors.
 Chemical kinetics of rapid reactions.
 Modelling and simulation of physical-chemical processes.

Team

Prof. Dr. Chem. Elena Maria Pică, Assoc. Prof. Dr. Chem. Mihaela Ligia Ungureșan, Lecturer Dr. Eng. Dana - Adriana Iluțiu - Varvara
 Prof.Dr.Phys. Eugen Culea, Dr.Eng.Ec. Luminița Cristina Pirău, Dr.Eng. Andra Gagi, Drd.PhD. students: Mioara Ferent (Zagrai), Drd. Phd. students: Cornel Sava

Representative projects

LAREAN, "Regional laboratory for complex spectroscopic and electrochemical analyzed", BCUM, http://ro4096.uefiscsu.ro/componenta3/detalii.php?comisie=1&id=403&unitate=componenta3_cncsis&prog=b (1999-2009)
NITRITSENZ, "Nitrite selectiv electrochemical sensor for controlling nitrite in food products", PNCDI-AGRAL, <http://www.precis.ro/modules.php?name=News&file=article&sid=97> (2004-2007)
MAVOPTTEL, "Multifunctional nanocomposites based supramolecular optoelectronic properties, photochemical, electrochemical and bio-precursors for advanced materials", CEEX, <http://acad-icht.tm.edu.ro/nationale/mavoptel.htm>; http://www.infoinvent.md/pdf/infoinvent/catalog/2013/section_A.pdf (2006-2008)
BIOAMBREG, "Development of green products in biodegradable, packaging and components for achieving protection", CEEX, http://www.inma.ro/pagina_web_parteneriate/Cioica/DatePaqWEB_1.htm (2007-2010)

Significant results

The most representative publications of the past 5 years:

1. S. Rada, M. Zagrai, M. Rada, E. Culea, L. Bolundut, M.-L. Unguresan and E.M. Pică, "Spectroscopic and electrochemical investigations of lead-lead dioxide glasses and vitroceraamics with applications for rechargeable lead-acid batteries", in *Ceramics International*, vol.20. no.3, 2016, pp.3921-3929.
2. A.C. Gagi, E.M. Pică, X. Querol and C.S. Botezan, "Analysis of predictors related to soil contamination in recreational areas of Romania", in *Environmental Science and Pollution Research*, vol.22, no.23, 2015, pp.18885-18894.
3. A.C. Gagi, E. M. Pică, Ghe. Blaga, P. Pășcuță and A. Keri, "Mineralogical Characterisation and Heavy Metals

- Assessment of Soils from Urban Recreational Areas in Central Transylvania", in *Studia Universitatis "Babeş-Bolyai", Series Chemia*, vol.LIX, no.1, 2014, pp.87-98.
4. M. Zagrai, L. Rus, S. Rada, S. Stan, M. Rada, L. C. Bolundut, E.M. Pică and E. Culea, "Lead metallic-lead dioxide glasses as alternative of immobilization of the radioactive Wasters", in *Journal Non-Crystalline Solids*, vol.405, 2014, pp.129-134.
 5. C.I. Neamtu, L. C. Bolundut and E. M. Pică, "Ozonation Influence on Aluminium Ions from an Aqueous Solution, in Different Temperature Conditions", in *Applied Mechanics and Materials Journal*, vol.420, 2013, pp.129-133.
 6. C.I. Neamtu, E. M. Pică and L. C. Bolundut, "Ozone effect on waste water containing lead compounds", in *International Global Analysis Research Journal*, vol.2, no.8, 2013, pp.53-54.
 7. M. Rada, L. Bolundut, E. M. Pică, M. Zagrai, S. Rada and E. Culea, "Mixed ionic-electronic conduction and electrochemical behavior of the lead and molybdenum ions in the lead-molybdate-germanate glasses" in *Journal of Non-Crystalline Solids*, vol.365, 2013, pp.105-111.
 8. E.M. Pică, I. Popișter, Z. Slížková and V. Micle, "Short Study about Removing the Black Crust formed by the Influence of SO₂, NO_x, CO₂ on Saint Michael's Church Masonry in Cluj-Napoca, Romania, by Chemical and Physical Methods", in *International Journal of Latest Research in Science and Technology*, vol.2, no.6, 2013, pp.74-76.
 9. E.M. Pică, I. Popișter, L. C. Bolundut, C. I. Neamtu, L. C. Pirău and V. Duca, "Chemical study of the carbon dioxide influence on cultural heritage", in *Proceedings of The 4th European Conference on Chemistry for Life Sciences "4ECCLS"*, August 31-September 3, 2011, Budapest, Hungary, Monduzzi Editore International Proceedings Division, Bologna, Italy, pp.79-84.
 10. D. Vlascici, S. Pruneanu, L. Olenic, F. Pogacean, V. Ostafe, V. Chiriac, E. M. Pică, C. Bolundut, L. Nica and E. Fagadar-Cosma, "Manganese (III) porphyrins based potentiometric sensors for diclofenac assay in pharmaceutical preparations", in *Sensors*, vol. 8, 2010, pp. 8850-8864.
 11. M.-L. Ungureșan and V. Muresan, "PID Control System for a Distributed Parameter Process", in *Applied Mechanics and Materials*, vol.555, 2014, pp.222-231.
 12. M.-L. Ungureșan, A. Măicăneanu, F. V. Dulf, D. Gligor and E.-H. Dulf, "Experimental Study and Modelling of Iron and Copper Adsorption on Natural Zeolites", in *Journal of Thermal Analysis and Calorimetry*, vol.110, no.3, 2012, pp.1293-1297.
 13. M.-L. Ungureșan and G. Niac, "Pre-equilibrium Kinetics. Modeling and Simulation", in *Russian Journal of Physical Chemistry*, vol.85, no.4, 2011, pp.549-556.
 14. M.-L. Ungureșan and D. M. Gligor, "Comparison between the experimentally and numerically modelled and simulated kinetic parameters corresponding to Michaelis - Menten equation, for NADH sensors based on polymeric phenothiazine modified electrodes", in *Asian Journal of Chemistry*, vol.22, no.1, 2010, pp.475-482.
 15. D. A., Iluțiu - Varvara, E.M. Pică and L. Brândușan, "Assessment of air environmental factor pollution to the steelmaking", in *Bulletin of the Polytechnic Institute of Jassy, Construction. Architecture Section. Vol.LIV (LVIII), Fasc.3*, 2011, pp.113 -118.
 16. D. A., Iluțiu - Varvara., E.M. Pică and L. Brândușan, "Researches Regarding of Recovering Potential of Slag Components from Electric Steel Mills", in *Bulletin UASVM, Agriculture*, no.68 (2), 2011, pp.54-58.
 17. D. A., Iluțiu - Varvara, L. Brândușan, G. Arghir and E.M. Pică, "Researches about the characterization of metallurgical slags for landfilled wastes minimization", in *Environmental Engineering and Management Journal (EEMJ)*, vol.14, no.9, 2015, pp.2115-2126.

Significant solutions:

Determination of various ions in different environmental samples;
 Analytical control of chemical and biochemical products/processes;
 Research-development studies performed, for environmental pollution.

Products and technologies:

1. The development of ecologic products from biodegradable materials for some packs and protection equipment.
2. Electrocatalysis of some transformation reaction for a major different pollutants in inorganic and organic mater.
3. Nanomaterials with applications in mediated electrocatalysis using modified electrodes.

Patents:

1. Dana Vlascici, Elena Maria Pică, Cosma - Făgădar Eugenia, Bizerea Otilia, Costișor Otilia, Cosma Viorica, 2010. "Senzor potențometric nitrit-selectiv", *Brevet de invenție*, Nr.122.790, în *Buletinul Oficial de Proprietate Industrială*, Secțiunea: Brevete de invenție, Nr.1, pp.72; http://www.osim.ro/publicatii/brevete/bopi_2010/bopi110.pdf
2. Eugenia. Fagadar-Cosma, Dana. Vlascici, Elena Maria Pică, Otilia Costișor, Viorica Cosma, Liliana Olenic, 2012. Otilia Bizerea, "Procedure for Obtaining of A Highly Selective Potentiometric Sensor for Silver Ion Detection Based on Porphyrin Ionophore", *Brevet de invenție*, Nr.123.447, în *Buletinul Oficial de Proprietate Industrială*, Secțiunea: Brevete de invenție, Nr.5, pp.104; http://www.osim.ro/publicatii/brevete/bopi_2012/bopi_inv_05_2012.pdf

The offer addressed to the economic environment

| | |
|------------------------|--|
| Research & development | The development of some methods for achievement of electrochemical sensors and achievement of some new sensors used in different measurements (water and soil of environmental measurements) The development of advanced modeling procedures, identification, monitoring and control of processes occurring in electrochemical interface. |
| Consulting | Consulting, design, research and prototyping of different sensors based on reduction of ions element. |
| Training | Advanced Materials Electrochemistry Obtaining of the Electrochemical Sensors Modeling and Simulation of the Chemical Processes Synthesis of Advanced Materials |