

RESEARCH LABORATORY FOR COMPOSITE MATERIALS AND ENVIRONMENTAL CHEMISTRY

Contact details

Name	Research Laboratory for Composite Materials and Environmental Chemistry		
Acronym	CMEC		
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Faculty Department	Faculty of Materials and Environment Engineering Physics and Chemistry Department		
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Areas of expertise

Materials science and engineering: oxides, sulphides, polymeric materials, biomaterials, polymers recycling, nanomaterials;

Environment science and engineering: pollutants separation and degradation trough adsorption or photodegradation;

Team

Prof. Eng. PhD. Violeta POPESCU, Eng. PhD Andreia MOLEA, Eng. PhD George Liviu POPESCU, Eng. PhD student Timea GHERMAN, PhD student Diana DAVID.

Representative projects

COMBREG, “Research related to the obtaining of fuels and raw materials from renewable sources. The project aims to develop methods for organic waste materials recycling”

HIDROSOL, “Photoelectrolytical hydrogen production”, CEEX,
http://oc1.itimcluj.ro/~dsilipas/hidrosol/index_files/Page561.htm (2006-2008)

FLUORODENT, “Biomaterials composites based on new fluorinated monomers reinforced with nano and micro bioactive fillers with remnants anticarcinogenic properties and high adhesion to dental tissues.”, PN2,
<http://chem.ubbcluj.ro/pagini/biochimie/radu/florodent/Florodent.htm> (2008-2011)

ENDODENT, “Complex biomaterials with high specificity used in endodontic treatments”, PN2,
<http://granturi.ubbcluj.ro/endodent/ENDODENT/> (2008-2011)

COSMETICIDENT, “New generation of biomaterials for cosmetic dentistry/ project manager”, PN2,
<http://granturi.ubbcluj.ro/cosmeticident/Cosmeticident.htm> (2012-2016)

Significant results

The most representative publications of the past 5 years:

1. Popescu G.L., Filip N., Popescu V., Research aiming simultaneously recycling of waste polyolefins by pyrolysis, in order to obtain some fuels for compression ignition engines, (2016) Applied Mechanics and Materials, Vol. 822, pp. 235-242.
2. Molea, A., Popescu, V., Rowson, N.A., Cojocar, I., Dinescu, A., Dehelean, A., Lazăr, M., Correlation of Physicochemical Properties with the Catalytic Performance of Fe-Doped Titanium Dioxide Powders (2015) Industrial and Engineering Chemistry Research, 54 (30), pp. 7346-7351.
3. Popescu, G.L., Filip, N., Molea, A., Popescu, V., The effect of using pyrolysis oils from polyethylene and diesel on the pollutant emissions from a single cylinder diesel engine (2015) Studia Universitatis Babeş-Bolyai Chemia, 60 (4), pp. 273-288.
4. Molea, A., Popescu, V., Rowson, N.A., A comparative study of the photo-catalytic performance of amorphous and nano-crystalline TiO₂ (2015) Optoelectronics and Advanced Materials, Rapid Communications, 9 (3-4), pp. 431-435.
5. Popescu, G.L., Filip, N., Popescu, V., A comparison between diesel and fuel obtained from recycled waste plastics

used for fueled diesel engines (2015) INMATEH - Agricultural Engineering, 45 (1), pp. 141-148.

6. Moşneag, S.C., Popescu, V., Neamţu, C., Borodi, G., Study on the removal of nitrate in groundwater from Căpuş, Cluj county by natural zeolite of Mirşid and granular activated carbon (2015) Desalination and Water Treatment, 56 (12), pp. 3313-3322.
7. Popescu, V., Molea, A., Dinescu, A., Rusu-Trişcă, C., Moldovan, M., Popescu, G.L., Optical properties of pbs crystals obtained on glass substrate from solutions containing hydroxylamine hydrochloride in an ultrasonic baths (2015) Chalcogenide Letters, 12 (7), pp. 363-373.
8. Molea, A., Popescu, V., Rowson, N.A., Dinescu, A.M., Influence of pH on the formulation of TiO₂ nano-crystalline powders with high photocatalytic activity (2014) Powder Technology, 253, pp. 22-28.
9. Prodan, D., Molea, A., Moldovan, M., Popescu, V., Silaghi-Dumitrescu, L., Prejmerean, C., Boboia, S., Sarosi, C., Synthesis and characterization of the hydroxyapatite and TiO₂ doped hydroxyapatite powders (2014) Journal of Optoelectronics and Advanced Materials, 16 (11-12), pp. 1300-1305.
10. Prodan, D., Moldovan, M., Furtos, G., Chisnoiu, R., Popescu, V., Păstrav, O. Achieving and evaluation by in vitro tests of new experimental endodontic sealers (2014) Revista Romana de Materiale/ Romanian Journal of Materials, 44 (4), pp. 414-420.
11. Moşneag, S.C., Popescu, V., Dinescu, A., Borodi, G. Utilization of granular activated carbon adsorber for nitrates removal from groundwater of the Cluj region (2013) Journal of Environmental Science and Health - Part A Toxic/Hazardous Substances and Environmental Engineering, 48 (8), pp. 918-924.
12. Popescu, V., Răducanu, D., Dinescu, A., Dănilă, M., Popescu, G.L. Influence of ultrasounds on structural and morphological properties of PbS deposited on glass substrate (2013) Chalcogenide Letters, 10 (5), pp. 159-165.
13. Molea, A., Popescu, V., Rowson, N.A., Effects of I-doping content on the structural, optical and photocatalytic activity of TiO₂ nanocrystalline powders (2012) Powder Technology, 230, pp. 203-211.
14. Popescu, V., Popescu, G.L., Optical properties of lead sulfide films obtained by chemical bath deposition from static and ultrasonic baths (2011) Journal of Optoelectronics and Advanced Materials, 13 (7), pp. 926-932.
15. Pop, A.E., Popescu, V., Danila, M., Batin, M.N., Optical properties of CuxS NANO-powders, (2011) Chalcogenide Letters, 8 (6), pp. 363-370.
16. Popescu, V., Popescu, G.L., Indrea, E., Silipaş, D.T., CdS powders obtained by chemical bath deposition (2011) Materials Science Forum, 672, pp. 109-112.
17. Suci, R.-C., Roşu, M.C., Silipaş, T.D., Indrea, E., Popescu, V., Popescu, G.L., Fe₂O₃ - TiO₂ thin films prepared by sol-gel method (2011) Environmental Engineering and Management Journal, 10 (2), pp. 187-192.

Activity with undergraduate students: More than 22 graduation thesis or dissertation.

Activity with PhD students. Research activity with 9 PhD students: 7 with finalized thesis and 2 in progress.

Activity with postdoctoral students. Research activity of 2 postdoctoral students.

Patent no. 128800/2015. M. Moldovan, L. Silaghi-Dumitrescu, G. Furtoş, H. Iovu, C. Petrea, V. Popescu, C. Saroşi, S. Boboia, M. Filip, A.L. Colceriu Burtea, R.L. Silaghi-Dumitrescu. Compozit de restaurare indirecta cu aplicabilitate in stomatologie.

Products

1. IR photosensitive PbS films; semiconducting PbS, CuS, CdS, TiO₂, ZnO, Fe₂O₃ films and powders.
2. Fuels from plastic waste.
3. Biodegradable plastic materials.
4. Diverse natural extracts.

The offer addressed to the economic environment

Research & development	The correlation between optical, structural and morphological properties of semiconductors. The obtaining of materials with photocatalytic properties. Chemical recycling of plastic materials. Fuels obtaining, characterization and testing.
Consulting	FT-IR and UV-VIS spectroscopy. Plastic materials characterization and recycling.
Training	Rapid identification of organic compounds by IR spectroscopy using ATR-FTIR. Elaboration of UV-VIS spectroscopic quantitative analysis methods. Polymers recycling.