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Chimie anorganică și
coordinativă

Analiză structurală
anorganică

Conducător doctorat
(din 2009)

Doctorat

Univ. „Alexandru Ioan
Cuza” din Iași, 1999

Bursă Post doc

Univ. Paris XI (Sud),
France, 2003-2004

Bursă de cercetare
(doctorat)

Univ. Paris XI (Sud)
France, 1997-1998

Stagii de cercetare

Univ. Konstanz,
Germania, Univ. Paris
XI (Sud) France.

Aurel PUI

Domenii de cercetare/interes

- Sinteza și caracterizarea de compuși coordinativi
- Studiul legării reversibile a oxigenului molecular
- Sinteza și caracterizarea de nanoparticule magnetice
- Aplicații ale nanoparticulelor magnetice și materialelor anorganice
- Analize FTIR ale unor materiale și compuși anorganici, compuși organici, produși biologici, polimeri, produse alimentare, medicamente, soluri.

Sinteza și caracterizarea de compuși coordinativi cu diverși liganzi (baze Schiff de tip Salen și Salophen, ilide, calixarene etc.). Caracterizarea compușilor prin spectroscopie UV-Vis, FTIR, RMN, RPE, voltametrie ciclică, spectrometrie de masă, analiză termică.

Studiul capacității compușilor coordinativi de a lega reversibil O_2 .

Determinarea activității antimicrobiene și catalitice a compușilor coordinativi.

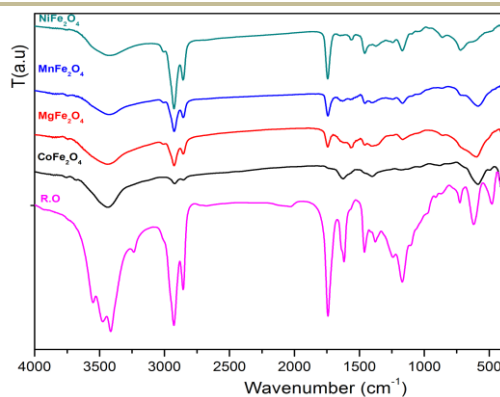
Analize FTIR și termice a unor probe biologice/mediu (ciuperci, plante, soluri), alimente, etc., și prelucrarea statistică a rezultatelor.

Sinteza și caracterizarea de nanoparticule magnetice (MNPs) de forma MFe_2O_4 cu structură de tip spinel folosind ca surfactanți uleiuri vegetale – non toxice.

Caracterizarea MNPs prin spectroscopie FTIR, microscopie electronică SEM, microscopie de transmisie TEM, difracție de raze X, analiză termică etc.

Studiul proprietăților magnetice, magnetizația de saturație (M_s), magnetizația remanentă (M_r) și câmpul coercitiv (H_c), ale MNPs.

Aplicații ale MNPs în decolorarea apelor uzate, eliberare controlată de medicamente, senzori de gaze etc.



Publicații (selective)

D. Gherca, N. Cornei, O. Mentré, H. Kabbour, S. Daviero-Minaud, **A. Pui**, In situ surface treatment of nanocrystalline MFe_2O_4 ($M = Co, Mg, Mn, Ni$) spinel ferrites using linseed oil, *Applied Surface Science*, 287, 490-498, **2013**.

A. Pui, D. Gherca, N. Cornei, Synthesis and characterization of MFe_2O_4 ($M=Mg, Mn, Ni$) nanoparticles, *Materials Research Bulletin*, 48(4), 1357-1362, **2013**.

R. Postolachi, R. Danac, N. J. Burma, **A. Pui**, M. Balan, S. Shova, C. Deleanu, New cycloimmonium ylide ligands and their palladium(II) affinities, *RSC Advances*, 3(38), 17260-17270, **2013**.

A. Pui, T. Malutan, L. Tataru, C. Malutan, D. Humelnicu, G. Carja, New complexes of lanthanide $Ln(III)$, ($Ln = La, Sm, Gd, Er$) with Schiff bases derived from 2-furaldehyde and phenylenediamines, *Polyhedron*, 30, 2127-2131, **2011**.

R. Danac, R. Rusu, A. Rotaru, **A. Pui**, S. Shova, New conjugates of calix[4]arenes bearing dipyrindine and indolizine heterocycles, *Supramolecular Chemistry*, 24, 424-435, **2012**.

A. Pui, C. Policar, J.-P. Mahy, Electronic and steric effects in cobalt Schiff bases complexes. Synthesis, characterization and catalytic activity of some cobalt(II) *tetra*-halogens-dimethyl salen complexes, *Inorg. Chim. Acta*, 360, 2139-2144, **2007**.

Aurel PUI

Research Areas/Interest

- Synthesis and characterization of coordination compounds
- Study of the reversible binding of molecular oxygen
- Synthesis and characterization of magnetic nanoparticles and inorganic materials
- Applications of magnetic nanoparticles and inorganic materials
- FTIR analysis of inorganic compounds and materials, organic compounds, products biological, polymers, food, drugs, soils.

Synthesis and characterization of coordination compounds with different ligands (type Schiff bases as Salen and Salophen, ylides, calixarene etc.). Characterization of compounds by UV-Vis, FTIR, NMR, EPR, cyclic voltammetry, mass spectrometry, thermal analysis.

The study of coordination compounds ability to reversibly bind of dioxygen.

Determination of catalytic and antimicrobial activity of the coordination compounds.

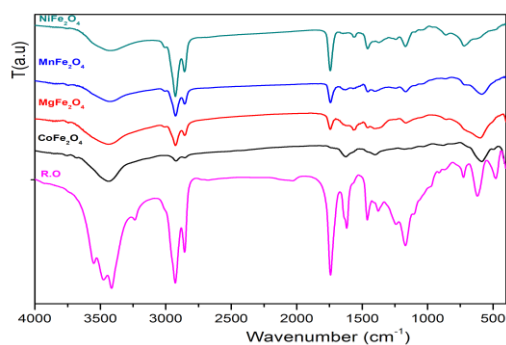
FTIR and thermal analysis of biological samples / medium (fungi, plants, soils), food, etc., and statistical processing of the results.

Synthesis and characterization of magnetic nanoparticles (MNPs), as MFe_2O_4 with spinel structure, using non toxic surfactants as vegetable oils.

Characterization of MNPs by FTIR spectroscopy, electron microscopy, SEM, TEM transmission microscopy, X-ray diffraction, thermal analysis etc.

Study of the magnetic properties, saturation magnetization (M_s), remanent magnetization (M_r) and coercive field (H_c), of the MNPs.

Applications of MNPs in wastewater discoloration, controlled release of drugs, gas sensor etc.



Publications (selection)

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R. Postolachi, R. Danac, N. J. Buurma, **A. Pui**, M. Balan, S. Shova, C. Deleanu, New cycloimmonium ylide ligands and their palladium(ii) affinities, *RSC Advances*, 3(38), 17260-17270, **2013**.

A. Pui, T. Malutan, L. Tataru, C. Malutan, D. Humelnicu, G. Carja, New complexes of lanthanide $Ln(III)$, ($Ln = La, Sm, Gd, Er$) with Schiff bases derived from 2-furaldehyde and phenylenediamines, *Polyhedron*, 30, 2127-2131, **2011**.

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A. Pui, C. Policar, J.-P. Mahy, Electronic and steric effects in cobalt Schiff bases complexes. Synthesis, characterization and catalytic activity of some cobalt(II) *tetra*-halogens-dimethyl salen complexes, *Inorg. Chim. Acta*, 360, 2139-2144, **2007**.



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Inorganic and coordination chemistry
Inorganic structural analysis

PhD Supervisor
(from 2009)

PhD studies

„Alexandru Ioan Cuza” from Iași University, 1999

Postdoc

Scholarship

Paris XI (Sud), University, France, 2003-2004

Research

Scholarship (PhD)

Paris XI (Sud), University, France, 1997-1998

Research Internships

Konstanz University, Germania, Paris XI (Sud) University, France.