UNIVERSITATEA DIN BUCUREȘTI

VIRTUTE ET SAPIENTIA

Universitatea Babes-Bolyai
Cluj-Napoca

FUNCTIONALIZED HIERACHICAL STRUCTURES ON GRAPHENE EXHIBITING MAGNETIC, ADSORPTION AND CATALYTIC PROPERTIES

Financial support: UEFISCDI

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INOVARE SI CREATIVITATE
UNITATEA EXECUTIVA PENTRU FINANTAREA INVATAMANTULUI SUPERIOR, A CERCETARII DEZVOLTARII SI INOVARII

Project Code: *PN-III-P4-ID-PCCF-2016-0088 (1* din ***01/07/2018)***

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Partners and Management

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Project Budget

No.	BUDGET CHAPTER (EXPENSES)	2018 (lei)	2019 (lei)	2020 (lei)	2021 (lei)	2022 (lei)	TOTAL (lei)
1	SALARIES	307.500	670.000	985.000	1.235.000	387.500	3.585.000
2	INVENTORY	343.240	2.340.000	277.500	268.000	136.760	3.365.500
3	MOBILITY	45.000	99.000	99.000	40.000	30.000	313.000
4	OVERHEAD	148.935	251.000	324.750	373.250	138.565	1.236.500
	TOTAL BUDGET	**844.675**	**3.360.000**	**1.686.250**	**1.916.250**	**692.825**	**8.500.000**

Abstract

The present research proposal aims to develop a series of directions which are less or non-explored to date in the chemistry of graphene. Its objectives rely on the experience of the four participants in organic synthesis, organometallic chemistry, molecular magnetism and catalysis. The project will stimulate not only the enhancement of the value of previously synthesized compounds by the partners, but also the development of an original chemistry. The hierarchical organization of organometallic – classical transition metal complexes on graphene surface is a step forward in materials science. The design of 3-D frameworks incorporating graphene is original and opens interesting perspectives for applications. The grafting of magnetic and luminescent complexes on graphene could bring an important added value in molecular magnetism. The catalytic processes to be investigated are carefully selected, in order to address important problems in organic synthesis, environmental protection and energy. The project will focus on the following major objectives: (i) design of networks by covalent connections between the decorated graphene sheets; (ii) design of graphene-based hybrid materials with appropriate organometallic/metalloid units as ligands for transition metals; (iii) single molecule magnets and luminescent molecules grafted on graphene; (iv) functionalization of graphene with macrocycles, cryptands and rotaxanes for organocatalytic reactions; (v) development of multifunctional catalysts for controlled cascade reactions; (v) applications in catalysis (the valorization of the CO2 emissions; the hydrogenation of nitro-alkenes and mixtures of acetylene-ethylene; C-C and C-N coupling reactions) and gas sorption. A special attention in these studies will be addressed to the investigation of the catalytic mechanisms.

Objectives

The main objectives of the present project are:

O1. Assembling hierarchically organized architectures incorporating graphenes.

O2. Exploring graphene-grafted SMMs and luminescent molecules.

O3. Gas storage and gases separation with rational designed hierarchical architectures.

O4. Investigation of the newly designed hierarchical (supra)molecular architectures grafted onto graphenes in catalysis.

Dissemination of Results - 2018

Conferences

1. *Sinteza și caracterizarea de noi compuși organometalici ai stibiului(III) și bismutului(III) de tipul [2-(GF*)C_6H_4]$_n$$MX_{3-n}$ (M = Sb, Bi; n = 1-3; GF* = −CH=O, −CH=N$CH_2C_6H_4$N-2', −CH=N$CH_2C_6H_4$N-4')*, F.-A. Adăscăliței, C. Silvestru, la *Conferința Școlilor Doctorale din Consorțiul Universitaria*, Căciulata, Octombrie 31 - Noiembrie 3, **2018** (oral presentation).

2. *New hypercoordinateddiorganotin(IV) with dithiocarbamato or tetraorganodichalcogenimidodiphosphinatoligands,* E. Denes, N. Chiorean, A. Silvestru, *A XXXVII-a Conferință Națională de Chimie*, Căciulata, Octombrie 2-5, **2018** (poster).

Dissemination of Results - 2018

Conferences

3. *Synthetic "host molecules", mechanically interlocked and self assembled architectures: from design to applications,* Ion Grosu, *A XXXVII-a Conferință Națională de Chimie*, Căciulata, Octombrie 2-5, **2018** (plenary lecture).

4. *New pyridine/hydroquinone based [2]rotaxanes: synthesis of the building blocks* Teodor-Aurelian Cucuiet, Cătălin Anghel, Niculina D. Hădade, Ion Grosu, *A XXXVII-a Conferință Națională de Chimie*, Căciulata, Octombrie 2-5, **2018** (poster).

5. *Conformational versatility of a new macrocycle based on 1,3-dioxane units,* Alexandra Bogdan, Andreea Pentronela Crişan, Ionuț-Tudor Moraru, Ion Grosu, *A XXXVII-a Conferință Națională de Chimie*, Căciulata, Octombrie 2-5, **2018** (poster).

Dissemination of Results - 2019

Articles

1. *Lead(II) siloxides*, A.-A. Someșan, E. Le Coz,C. I. Raţ, V. Dorcet, T. Roisnel, C. Silvestru and Y Sarazin, *Chem. Eur. J.* (2019) *published on-line*. DOI: 10.1002/chem.201904713

2. *Spirobifluorene-based porous organic polymers as efficient porous support for Pd and Pt for the selective hydrogenations,* M. Trandafir, L. Pop, N.D. Hădade, I. Hristea, C.M. Teodorescu, F. Krumeich, J.A. van Bokhoven, I. Grosu, V.I. Parvulescu, *ChemCatChem* 11 (2019) 538-549

3. *N-Doped Defective Graphene from Biomass as Catalyst for CO_2 Hydrogenation to Methane,* B. Jurca, C. Bucur, A. Primo, P. Concepción, V.I. Parvulescu, H. García, *ChemCatChem* 11 (2019) 985-990.

4. *Nitrogen-doped graphene as metal free basic catalyst for coupling reactions,* N. Candu, I. Man, A. Simion, B. Cojocaru, S. Coman, C. Bucur, A. Primo, H. Garcia, V.I Parvulescu, *J. Catal.* 376 (2019) 238-247.

Dissemination of Results - 2019

Articles

5. *CO_2 Methanation Catalized by Oriented MoS_2 Nanoplatelets Supported on few Layers Graphene,* A. Primo, J. He, B. Jurca, B. Cojocaru, C. Bucur, V.I. Parvulescu, H. Garcia, *Appl. Catal. B: Environ.* 245 (2019) 351-359.

6. *Batch versus flow stereoselective hydrogenation of a-acetamido-cinnamic acid catalyzed by an Au(I) complex,* A. Negoi, B. Cojocaru, V.I. Parvulescu, N. Imlyhen, M. Gouygou, *Mol. Catal.* 474 (2019), Article number 110420

7. *Advances in porous and nanoscale catalysts for viable biomass conversion,* P. Sudarsanam, E. Peeters, E.V. Makshina, V.I. Parvulescu, B.F. Sels, *Chem. Soc. Rev.* 48 (2019) 2366-2421.

Dissemination of Results - 2019

Conferences

1. *Novel [$Zn^{II}Ln^{III}$] luminiscent coordination compounds deposited of graphene,* A.A. Apostol, T. Mocanu, C. Maxim, I. Mihalache, O. Tutunaru, C. Pachiu, M. Andruh, Sesiunea de Comunicări Științifice Studențești, ediția a 15-a, Facultatea de Chimie, Universitatea din București, 24-25 mai 2019. (prezentare orală)

2. *Novel [$Zn^{II}Ln^{III}$] luminiscent coordination compounds deposited of graphene,* A.A. Apostol, T. Mocanu, C. Maxim, I. Mihalache, O. Tutunaru, C. Pachiu, M. Andruh, EuroNanoForum 2019, București, 12-14 iunie 2019. (poster)

3. *Combinații complexe [$Zn^{II}Ln^{III}$] luminescente atașate pe suport de grafenă,* A.A. Apostol, T. Mocanu, C. Maxim, I. Mihalache, O. Tutunaru, C. Romanițan, C. Pachiu, M. Andruh, Sesiunea de Comunicări Științifice a Studenților, Masteranzilor și Doctoranzilor ”Chimia – Frontieră deschisă spre cunoaștere”, Iași, 20-21 iunie 2019. (prezentare orală)

Dissemination of Results - 2019

Conferences

4. *Novel [$Zn^{II}Ln^{III}$] luminiscent coordination compounds deposited of graphene,* A.A. Apostol, T. Mocanu, C. Maxim, I. Mihalache, O. Tutunaru, C. Pachiu, M. Andruh, Romanian International Conference on Chemistry and Chemical Engineerig, ediția a 21-a, Constanța - Mamaia, 4-7 septembrie 2019. (poster)

5. *Combinații complexe [$Zn^{II}Ln^{III}$] atașate pe suport de grafenă,* A. Apostol, T. Mocanu, C. Maxim, I. Mihalache, O. Tutunaru, C. Romanițan, C. Pachiu, M. Andruh, Conferința Națională a Doctoranzilor din Consorțiul Universitaria, ediția a 2-a, Timișoara, 11-14 noiembrie 2019. (prezentare orală)

6. *Self Assembled Architectures, Innovative Porous Organic Polymers and "Host Molecules": from Design to Applications,* I. Grosu, "; Zilele Academice Iesene, Iasi, 2-4 octombrie 2019 (Conferinta plenara)

Dissemination of Results - 2019

Conferences

7. *Metal-Free Self Assembled Architectures: from Design to Applications*, I. Grosu, “Marius Andruh, Coordination Chemistry and Friends” Symposium, Bucuresti, 31 oct. – 1 nov. 2019 (prezentare orală)

8. *Active-metal template synthesis of a [2]rotaxane using „click” chemistry*, T.-A. Cucuiet, C.C. Anghel, N.D. Hădade, I. Grosu, 9th International Conference of the Chemical Societies of the South-Eastern European Countries „Chemistry a Nature Challenger”, Târgoviște, 8-11 mai 2019, (poster)

9. *Shape-persistent NDI-based macrocycles with potential application as redox-active materials in organic lithium-ions batteries*, N. D. Hădade, A. Crișan, L. Pop, C. Nicolay, C. Golobciuc, I. Grosu, International Conference "Catalysis and Organic Synthesis” - ICCOS-2019 - Moscow, September 15-20, 2019 (poster)

Dissemination of Results - 2019

Conferences

10. *Supramolecular arhitectures supported by catemers of 2,7-dipyridylfluorene with ortho-, meta- or para- diiodotetrafluorobenzene isomers,* Lidia Pop, Ioana G. Grosu, Maria Miclăuş, Niculina D. Hădade, Anamaria Terec, Attila Bende, Ion Grosu, 21st European Symposium on Organic Chemistry, July 14th-18th, 2019, Vienna, Austria. (poster)

11. *Towards the synthesis of new [2]rotaxanes using the clipping strategy*, Teodor-Aurelian Cucuiet, Cătălin Anghel, Niculina Hădade, Ion Grosu, nternational Conference „Students for Students” Cluj-Napoca, 3-7 aprilie 2019, (prezentare orala)

12. *Pyridine-based [2]rotaxanes designed as switchable catalysts in coupling reactions,* Teodor-Aurelian Cucuiet, Cătălin Anghel, Niculina Hădade, Ion Grosu, Sesiunea de Comunicări Științifice Studențești, București, 24-25 mai 2019, (prezentare orala)

Dissemination of Results - 2019

Conferences

13. *Sinteza unui nou [2]rotaxan printr-o reacție active metal template CuAAC*, Cătălin Anghel, Teodor A. Cucuiet, Niculina Hadade și Ion Grosu, Conferinţa Naţională a Şcolilor Doctorale din Consorţiul UNIVERSITARIA, Ediţia a II-a Timişoara, 11– 14 noiembrie 2019

14. *Towards the synthesis of new NDI-based shape persistent macrocycles* Cyril Nicolay, Cătălin Anghel, Ion Grosu, Niculina D. Hădade, International Conference „Students for Students” Cluj-Napoca, 3-7 aprilie 2019, poster

15. *Heterocyclic diorganopnicogen compounds. Synthesis, structure and catalysis*, Anca Silvestru, Răzvan Șuteu, Ana Maria Toma, la 9th International Conference of the Chemical Societies of the South-East European Countries, Târgoviște, România, 8-11 Mai, **2019** (prezentare orală).

Dissemination of Results - 2019

Conferences

16. *Novel ambiphilic proligands containing antimony*, Corina Stoian, Ciprian I. Rat, Cristian Silvestru, la 9th International Conference of the Chemical Societies of the South-East European Countries, Târgoviște, România, 8-11 Mai, **2019** (poster).

17. *Novel homo-and heteroleptic Pb(II) species*, Adrian-Alexandru Someșan, Cristian Silvestru, Yann Sarazin, la 27th GECOM CONCOORD, Roz Armor, Erquy, France, 19-24 Mai, **2019** (poster).

18. *Tetrakis(4-carboxyphenyl)stannane - a versatile building block for heterometallic coordination polymers*, Alexandru Sava, Teodora Mocanu, Cristian Silvestru, Marius Andruh, Sergiu Shova, la 27th GECOM CONCOORD, Roz Armor, Erquy, France, 19-24 Mai, **2019** (poster).

Dissemination of Results - 2019

Conferences

19. *Main Group heavy metal compounds containing tetraphenylimidodiselenodiphosphinato ligands,* Cristian Silvestru, 14th International Conference on the Chemistry of Selenium and Tellurium, Santa Margherita di Pula (CA), Italia, 3-7 Iunie, **2019** (prezentare orală).

20. *New hypercoordinated triorganotellurium compounds with organophosphorus ligands*, Eleonora Denes, Anca Silvestru, la 14th International Conference on the Chemistry of Selenium and Tellurium, Santa Margherita di Pula (CA), Italia, 3-7 Iunie, **2019** (poster).

21. Graphenes: A great challenge as support and catalysts for organic reactions, environment remediation and energy production, V.I. Pârvulescu, 5th Indo-French Symposium on Functionalized Materials for Sustainable Catalytic and Related Applications, MATSUCAT-2019**,** 26 February – 1 March, 2019, Pune, India**.** (Conferinta plenara)

Dissemination of Results - 2019

Conferences

22. *Graphene film-supported oriented antimonium nanoplatelets as very efficient catalysts for Michael and Henry additions,* CHAOSV.I. Pârvulescu, (C-H Activation in Organic Synthesis) 6th Workshop, 3-5 April, 2019, Ayia Napa, Cyprus

23. *Engineering active sites by hydrogen plasma irradiation: Mimicking bifunctional metal/supported catalysts in hydrogenation reactions,* A. Primo, A.Franconetti, H. Garcia, M. Magureanu, N. Mandache, C. Bucur, C. Rizescu, B. Cojocaru, V.I. Parvulescu, 14th EUROPACAT, Germany, August 18-23, 2019.

24. *The direct catalytic synthesis of dicarboxylic acids from glucose,* N. Candu, M. El Fergani, A. Tirsoaga, V. I. Parvulescu, S. M. Coman, 8th Asia Pacific Congress in Catalysis (APCAT8), 4–7th August 2019, Bangkok, Thailand

Dissemination of Results - 2019

Conferences

25. *Transition-metal binuclear complexes as new graphene-supported heterogeneous catalysts,* I. Podolean, V.I. Parvulescu, M. Andruh, 8th Asia Pacific Congress in Catalysis (APCAT8), 4–7th August 2019, Bangkok, Thailand.

26. *Marine ulvan polysaccharide as a valuable pool of rare sugars,* I. Podolean, B. Cojocaru, S. Coman, E. Ioannou, S. Kikionis, V. Roussis, A. Primo, H. Garcia, V. I. Parvulescu, 5th International Congress on Catalysis in Biorefineries – CATBIOR 2019, 23-27 September 2019, Turku, Finland

Dissemination of Results - 2020

Articles

1. *Heterometallic metallacyclophanes constructed from side-off bicompartmental ligands,* M. Andruh, M. Mocanu, A.A. Patrascu, S. Ionescu, *J. Coord. Chem.,* 2020, acceptat, DOI: 10.1080/00958972.2020.1798940

2. *Luminescent [$Zn^{II}Ln^{III}$] complexes anchored on graphene. Synthesis and crystal structures of [$Zn^{II}Eu^{III}$] and [$Zn^{II}Tb^{III}$] complexes decorated with pyrene groups*, A.A. Apostol, I. Mihalache, T. Mocanu, O. Tutunaru, C. Pachiu, R. Gavrila, C. Maxim, M. Andruh, *Appl. Organomet. Chem*., acceptat, DOI: 10.1002/AOC.6126

3. *Halogen bonds (N---I) at work: supramolecular catemeric architectures of 2,7-dipyridylfluorene with ortho, meta- or para-diiodotetrafluorobenzene isomers,* I.G. Grosu, L. Pop, M. Miclăuş, N.D. Hădade, A. Terec, A. Bende, M. Bărboiu; I. Grosu, *Cryst. Growth Des.* 2020, 20, 5, 3429–3441

Dissemination of Results - 2020

Articles

4. *Click synthesis and complexation properties of a new unsymmetrical macrocycle bearing 1,4-dioxabenzene and triazole units,* C.C. Anghel, T.A. Cucuiet, E. Bogdan, A. Crișan, M. Matache, L. Pop, A. Terec, N.D. Hădade, *Rev. Roum. Chim.*, 2020, 65(6), 567-572.

5. *Selective Hydration of Electron-Rich Aryl-Alkynes by a Schrock-type Molybdenum Alkylidene Catalyst,* A. Crișan, A. Pop, E. Bogdan, M. Matache, L. Pop, A. Terec, I. Grosu, N.D. Hădade, *Rev. Roum. Chim.*, 2020, 65(7-8), 699-705.

6. *Molecular structures of (2-bromophenyl)diphenylstibane and {2'-bromo-[1,1'-biphenyl)-2-yl}diphenylstibane*, M. Olaru, K. T. Kegyes, C. I. Raţ, *Rev. Roum. Chim.,* 2020, 65(7-8), 719-724

Dissemination of Results - 2020

Articles

7. *Halogen-Bonded Organic Frameworks (XBOF) of perfluoroiodo- and perfluorodiiodobenzene with 2,2',7,7'-tetrapyridyl-9,9'-spirobifluorene,* L. Pop, I.G. Grosu, M. Miclăuş, N.D. Hădade, A. Pop, A. Bende, A. Terec, M. Barboiu, I. Grosu, *Cryst. Growth Des*., **2020***,* acceptat.

8. *Synthesis of esters of diaminotruxillic bis-amino acids by Pd-mediated photocycloaddition of analogs of the Kaede protein chromophore*, E.P. Urriolabeitia, P. Sánchez, A. Pop, C. Silvestru, E. Laga, A.I. Jiménez, C. Cativiela, *Beilstein J. Org. Chem.*, **2020**, *16*, 1111-1123.

9. *Hypercoordinated triorganotellurium(IV) derivatives of chalcogen-centred organophosphorus ligands*, E. Denes, A. Beleagă, A. Silvestru, *Inorg. Chim. Acta*, **2020**, *511*, 119841.

Dissemination of Results - 2020

Articles

10. *New hypercoordinated triaryltelluronium derivatives of organophosphorus ligands. Synthesis and structural characterization*, E. Denes, M. Vlassa, C. Silvestru, A. Silvestru, *Rev. Roum. Chim.*, **2020**, *submitted*.

11. *[2,6-Bis(dimethylaminomethyl)phenyl]mercury(II) acetate, [2,6-$(Me_2NCH_2)_2C_6H_3$]Hg(OAc) - a useful N,C,N pincer-containing intermediate for selective palladation of 1,3-$(Me_2NCH_2)_2C_6H_4$*, L. Kiss, S. Sergiu, M. Vlassa, A. Silvestru, C.I. Raț, C. Silvestru, *Rev. Roum. Chim.*, **2020**, *submitted*.

12. *Group 11 metal complexes of the pyrazole-derived diorganoselenide $(pzCH_2CH_2)_2Se$. Synthesis, solid state structure and solution behavior*, R. Popa, V. Lippolis, A. Silvestru, *Inorg. Chim. Acta*, **2020**, *submitted*.

Dissemination of Results - 2020

Articles

13. *Reactivity of a carbonyl moiety in organotin(IV) compounds. Novel Pd(II) and Cu(II) complexes supported by organotin(IV) ligands*, A.-A. Someșan, C. Silvestru, R.A. Varga, *Dalton Trans.*, **2020**, *submitted*.

14. *Synthesis and characterization of palladium decorated on the ternary nanocomposite of graphene oxide, $MnFe_2O_4$ nanoparticles and PAMAM dendrons as heterogeneous catalyst for reduction of nitroaromatic compounds*, K. Karami, A. Ramezanpour, M. Kharaziha, C. Silvestru, **2020**, *submitted*.

15. *Hypercoordinated diorganoantimony(III) compounds of types $[2\text{-}(Me_2NCH_2)C_6H_4]_2SbL$ and $[PhCH_2N(CH_2C_6H_4)_2]SbL$ (L = Cl, ONO_2, OSO_2CF_3). Synthesis, structure and catalytic behavior in the Henry reaction,* R. Şuteu, C.I. Raţ, C. Silvestru, A. Simion, N. Candu, V.I. Pârvulescu, A. Silvestru, *Appl. Organometal. Chem.* 34 (2020) e5393

Dissemination of Results - 2020

Articles

16. *Magnetic Fe@Y composites as efficient recoverable catalysts for the valorization of the recalcitrant marine sulfated polysaccharide ulvan*, J. Prech, E. Ioannou, V. Roussis, V. Kuncser, I. Podolean, S. Coman, V. Valtchev, V.I. Parvulescu, *ACS Sustain. Chem. Eng.* 8 (2020) 319-328.

17. *∞3[Cu_2(mand)$_2$(hmt)]–MOF: A synergetic effect between Cu(II) and hexamethylenetetramine in the Henry reaction,* H. Szalad, N. Candu, B. Cojocaru, T. Pasatoiu, M. Andruh, V.I. Parvulescu, *Chemistry 2* (2020) 50-62.

18. *Multifunctional nanocomposites with non-precious metals and magnetic core for 5-HMF oxidation to FDCA,* A. Tirsoaga, M. El Fergani, N. Nuns, P. Simon, P. Granger, V.I. Parvulescu, S.M. Coman, *Appl. Catal. B, Environ.* 278 (2020) Article number 119309.

Dissemination of Results - 2020

Articles

19. *Nanometer-thick films of antimony oxide nanoparticles grafted on defective graphenes as heterogeneous base catalysts for coupling reactions,* A. Simion, N. Candu, B. Cojocaru, S. Coman, C. Bucur, A. Forneli, A. Primo, I.C. Man, V.I Parvulescu, H. Garcia,, *J. Catal.* 390 (2020) 135-149.

20. P. Granger, V.I. Parvulescu, Application of Ionic Liquids for Sustainable Catalysis, in *Heterogeneous Catalysis for Energy Applications***,** T.R Reina, J. A Odriozola (Eds.), The Royal Society of Chemistry, 2020, chapter 10, 304-360.

21. *Solvent-free ketalization of polyols over germanosilicate zeolites: the role of the nature and strength of acid sites,* I. Podolean, J. Zhang, M. Shamzhy, V.I. Pârvulescu, J. Čejka, *Catal. Sci. Technol.*, 2020, 10, 8254-8264.

Dissemination of Results - 2020

Conferences

1. A. Primo, J. He, B. Jurca, B. Cojocaru, C. Bucur, H. Garcia, V.I. Parvulescu, Efficient hydrogenation of CO_2 to methane over oriented MoS_2 nanoplatelets supported on few layers graphene, 11th International Conference on Environmental Catalysis, 6th-9th September 2020, Manchester, UK (oral presentation).

Dissemination of Results - 2021

Articles

1. *Valmet chiral Schiff-base ligands and their copper(II) complexes as organo, homogeneous and heterogeneous catalysts for Henry, cyanosilylation and aldol coupling reactions.* Z. Arora, D.-I. Eftemie, A. Spinciu, C. Maxim, A. Hanganu, M. Tudorache, B. Cojocaru, O. D. Pavel, P. Granger, M. Andruh, V. I. Parvulescu, *ChemCatChem*, **13**, 4634 (2021).

2. *Luminescence thermometry based on one-dimensional benzoato-bridged coordination polymers containing lanthanide ions*. A. Topor, D. Avram, R. Dascalu, C. Maxim, C. Tiseanu, M. Andruh, *Dalton Trans*., **50**, 9881 (2021).

3. *Cu(II) and Ag(I) complexes of the pyrazole-derived diorganoselenide $(pzCH_2CH_2)_2Se$. Synthesis, solid state structure and solution behavior*, R.A. Popa, V. Lippolis and A. Silvestru, *Inorg. Chim. Acta*, **2021**, *520*, 120272.

Dissemination of Results - 2021

Articles

4. Ioan Stroia, Ionut Teodor Moraru, Maria Miclăuş, Ion Grosu, Claudia Lar, Ioana Georgeta Grosu, Anamaria Terec, **Solid-State and Theoretical Investigations of Some Banister-Type Macrocycles with 2,2'-Aldoxime-1,1'-Biphenyl Units,** Frontiers in Chemistry, **2021**, *96*, Article number 750418.

5. *Reactivity of a carbonyl moiety in organotin(IV) compounds. novel Pd(II) and Cu(II) complexes supported by organotin(IV) ligands*, A.-A. Someșan, C. Silvestru and R. A. Varga, *New J. Chem.*, **2021**, *45*, 3817-3827.

6. *Synthesis and characterization of ternary graphene oxide, $MnFe_2O_4$ nanoparticles, and PAMAM dendrons nanocomposite decorated with palladium as heterogeneous catalyst for nitroaromatics reduction*, A. Ramezanpour, K. Karami, M. Kharaziha, C. Silvestru and P. Bayat, *Appl. Organomet. Chem.*, **2021**, e6329.

Dissemination of Results - 2021

Articles

7. *C,O-chelated organotin(IV) derivatives as potential anticancer agents: synthesis, characterization and cytotoxic activity*, A.-A. Someșan, S.-M. Vieriu, A. Crăciun, C. Silvestru, P. Chiroi, A. Nutu, A. Jurj, R. Lajos, I. Berindan-Neagoe, R.A. Varga, *Appl. Organomet. Chem.*, **2021**, *accepted*.

8. *Recent progress and prospects in catalytic water treatment*, Vasile I. Parvulescu, Florence Epron, Hermenegildo Garcia, Pascal Granger, *Chem. Rev., DOI: 10.1021/acs.chemrev.1c00527.*

9. *Co−Fe Nanoparticles Wrapped on N Doped Graphitic Carbons as Highly Selective CO_2 Methanation Catalysts,* Bogdan Jurca, Lu Peng, Ana Primo, Alvaro Gordillo, Vasile I. Parvulescu, and Hermenegildo García: *ACS Appl. Mater. Interfaces* 2021, 13, 36976−36981.

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5. Ion Grosu, **Cyclophanes, Cryptands and Supramolecular Polymers with Pyridine, Phenothiazine and Triazine Units,** XXIX European Colloquium on Heterocyclic Chemistry, 26-28 April 2021 – virtual (postponed from August 2020, Rouen) – Keynote Lecture

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