



PNCD III- Proiecte complexe realizate în consorții CDI (PCCDI)

Domeniu 6 - Patrimoniu și identitate culturală

PN-III-P1-1.2-PCCDI-2017-0476

Contract no. 51PCCDI/2018





Unitatea Executivă pentru
Finanțarea Învățământului Superior,
a Cercetării, Dezvoltării și Inovării



MINISTERUL
EDUCAȚIEI
NAȚIONALE



MINISTERUL
CERCETĂRII
ȘI INOVĂRII

- **PROIECTULUI COMPLEX: TEHNOLOGII NOI DE DIAGNOZA SI TRATAMENT PENTRU CONSERVAREA SI REVITALIZAREA COMPONENTELOR ARHEOLOGICE ALE PATRIMONIULUI CULTURAL NATIONAL – ARHEOCONS**
- *proiect component P3: Materiale traditionale si avansate utilizate pentru protejarea componentelor arhitecturale ale patrimoniului cultural*

**Director proiect component P3:
Dr. ing. Luminita PREDOANA**

17.05.2018 – 30.09.2021

INSTITUȚII PARTENERE ÎN PROIECT

Denumirea instituțiilor participante in proiect	Acronim organizatie	Tip organizație	Rolul organizației in proiect
Institutul National de Cercetare Dezvoltare pentru Chimie si Petrochimie- ICECHIM, Bucuresti	ICECHIM	INCD	Coordonator proiect complex
Universitatea „Ovidius”, Constanta	UOC	UNI	Partener P1
Institutul De Chimie Fizica - Ilie Murgulescu, Bucuresti	ICF	IA	Partener P2
Universitatea VALAHIA din Targoviste	UVT	UNI	Partener P3



Scopul proiectului

- este ca prin parteneriatul între colective din cadrul unui institut național de cercetare dezvoltare (ICECHIM), doua universități (Universitatea Ovidius Constanta si Universitatea Valahia, Targoviste) cu tradiție și performanță instituțională recunoscută și un institut de renume al Academiei (ICF) sa contribuie la elaborarea unor tehnologii de obținere de noi materiale avansate, care respectă principiile autenticității, reversibilității și valorii, cu impact puternic asupra componentelor de patrimoniu imobil (fresca, metope si mozaic) si mobil (artefacte decorative din ceramica, sticla, metal, os, obiecte de arta si arheologie) si dezvolta noi tehnici aplicate practic pe: Mozaicul Roman si Mormantul Hypogeu, Constanta, Muzeul Adamclisi (metope), judetul Constanta, Castelul Corvinilor (Fresca Loggia Mathia) si Muzeul de Arheologie, Hunedora.

<i>Luminita Predoana</i>	<i>Cercetator st. CSII</i>	<i>Responsabil Proiect</i>
Fruth Victor	Cercetator st. CSI	Cercetător specialist
Atkinson Irina	Cercetator st. CSIII	Cercetător specialist
Marinescu Gabriela	Cercetator st. CSI	Cercetător specialist
Culita Daniela	Cercetator st. CSII	Cercetător specialist
Gingasu Dana	Cercetator st. CSII	Cercetător specialist
Mindru Ioana	Cercetator st. CSII	Cercetător specialist
Anghel Elena Maria	Cercetator st. CSII	Cercetător specialist
Stroescu Hermine	Cercetator	Cercetător
Mocioiu Oana	Cercetator st. CSIII	Cercetător
Pandele Cusu Jeanina	Cercetator st. CSIII	Cercetător
Mitran Raul	Cercetator st. CSIII	Cercetător
Todan Ligia	Cercetator st. CSII	Cercetător specialist
Petrescu Simona	Cercetator st. CSIII	Cercetător
Ciobanu Madalina	Cercetator st. CSIII	Doctorand
Bratan Veronica	Cercetator st. CSIII	Cercetător
Aricon Ludmila	Cercetator st.	Doctorand
Leontieș Anca Ruxandra	Cercetator st.	Cercetător
Preda Silviu	Cercetator st.	Cercetător
Rusu Adriana	Cercetator st.	Cercetător
Vladut Cristina	Asistent cercetare	Doctorand
Petcu Gabriela	Doctorand	Doctorand
Toma Valentin	Tehnician	Asistent cercetare
Poenaru Iuliana (2018-2019) / Codrea Cosmin Iulian (2020-2021)	Cercetator	Doctorand

Buget

Anul	Deviz (lei)		Total (lei)
	Buget	Cecuri	
2018	301587	20961	322548
2019	313983	22201	336184
2020	363784	11227	375011
2021	60326	1861	62187
Total	1039680	56250	1095930



Diseminarea rezultatelor

Vor fi întreprinse mai multe activități de sprijin care cuprind :

- Publicarea de articole in domeniu, in special in revistele cotate ISI.
- Prezentarea de comunicări științifice la evenimente interne si internationale.
- Participarea la mesele rotunde de profil.

Diseminarea rezultatelor

Premii, medalii, distinctii obtinute prin proces de selectie

1. R.M. Ion, D. Turcanu-Carutiu, L. Predoana, C. Radulescu, New diagnosis and treatment technologies for the conservation and revitalization of archeological components from national cultural heritage, Diploma of silver medal, EUROINVENT, Iasi, Romania, 16 - 18 Mai 2019.
2. R.M. Ion, D. Turcanu-Carutiu, L. Predoana, C. Radulescu, New diagnosis and treatment technologies for the conservation and revitalization of archeological components from national cultural heritage, Diploma de Excelenta, INVENTICA, Iasi, Romania, 29 - 31 Iulie 2020.

Realizarea de prezentări pentru participarea la conferințe internaționale si naționale

- 1) prezentare orala cu titlul Multifunctional composite coatings with self-cleaning and antimicrobial properties containing oxide nanopowders autori Victor Fruth, Luminita Predoana, Iuliana Poenaru, Ligia Todan, Ludmila Aricov, Gabriela Petcu, Hermine Stroescu, Iuliana Radut, Mariana Calin, Luiza Jecu la conferinta 5th Conference of the Serbian Society for Ceramic Materials 5SCS-2019 11th – 13th June, 2019
- 2) prezentare poster cu titlul Thermal behaviour of the TiO₂ powders obtained by microwave-assisted sol-gel method, autori Luminita Predoana, Jeanina Pandeale Cusu, Simona Petrescu, Silviu Preda la conferinta 2nd Journal of Thermal Analysis and Calorimetry Conference (2nd JTACC+V4 2019) June 18-21, 2019 at Budapest, Hungary.
- 3) prezentare poster cu titlul *Composite coatings based on sol-gel MgO or TiO₂ oxide nanopowders for buildings and monuments protection*, autori Victor Fruth, Iuliana Poenaru, Ligia Todan, Ludmila Aricov, Madalina Ciobanu, Luiza Jecu, Rodica Ion, Luminita Predoana la conferinta The XX International Sol-gel Conference, 25-30 august 2019, St. Petersburg, Russia
- 4) prezentare orala cu titlul "*Multifunctional Metal-Oxide-Nanopowder-Polymer Composite Coatings for Stone Built Heritage Conservation*" autori: Victor Fruth, Luminita Predoana, Iuliana Poenaru, Ligia Todan, Ludmila Aricov, Madalina Ciobanu, Luiza Jecu, Rodica Ion la conferinta PRIOCHEM XV – 2019, Bucuresti, 30 Octombrie - 01 Noiembrie 2019, Romania

Cerere Brevet Național Cu titlul *Procedeu de obținere a unor pelicule nanocompozite destinate protejării componentelor arhitecturale litice ale patrimoniului cultural*. **OSIM nr. A/00350/10.06.2019**

Acordare brevet inventie nr 134390 august 2021

Diseminarea rezultatelor

Capitol carte

1. Luminita Predoana, Irina Stanciu, Maria Zaharescu; Metal oxide nanomaterials obtained by sol-gel and microwave assisted sol-gel methods, in book titled 'Advances in Microelectronics: Reviews' Book Series, Vol. 2 Prof dr. Sergey Y. Yurish, chapter 7 *Metal Oxide Nanomaterials Obtained by Sol-gel and Microwave Assisted Sol-gel Methods*, Published by International Frequency Sensor Association (IFSA) Publishing, S. L, Spain, ian 2019, ISBN: 978-84-09-08160-8, page 221-249

Lucrari publicate

1. Dana Gingasu, Ioana Mindru, Daniela C. Culita, Luminița Predoana, Gabriela Petcu, Madalina Ciobanu, Silviu Preda, Jeanina Pandele-Cusu, Simona Petrescu, *MgO obtained by chemical and green synthesis methods and applied in photocatalytic degradation of methyl orange*, Rev. Roum. Chim., 2021, 66(5), DOI: 10.33224/rch.2021.66.5.10

Lucrari in curs de redactare

1. Victor Fruth, Ligia Todan, Cosmin Iulian Codrea, Ludmila Aricov, Madalina Ciobanu, Iuliana Poenaru, Luiza Jecu, Rodica Ion, Luminita Predoana, *Composite coatings based on sol-gel MgO or TiO₂ oxide nanopowders for buildings and monuments protection*, in curs de redactare
2. Jeanina Pandele-Cusu, Simona Petrescu, Silviu Preda, Luminita Predoana, *Thermal behavior of the TiO₂ powders obtained by microwave-assisted sol-gel method*, in curs de redactare se trimite spre publicare la Journal of Thermal Analysis and Calorimetry
3. Claudiu Eduard Rizescu, Diana Alexandra Mine, Irina Atkinson, Adriana Rusu, Luminita Predoana, Raluca-Maria Stirbescu, Anca Irina Gheboianu, Rodica Mariana Ion, *CaAl - layered double hydroxides for heritage conservation - preparation, characterization and kinetic stability of their dispersion in solvent*



PNCD III- Consortium-based complex projects CDI (PCCDI)

Domain 6 – Patrimony and cultural identity

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- **COMPLEX PROJECT:** Novel diagnosis and treatment technologies for the conservation and revitalization of archeological components of national cultural patrimony
- *Project section P3:* Conventional and advanced materials used for the protection of architectural and cultural heritage objects

Project section leader P3:
Dr. ing. Luminita PREDOANA

17.05.2018 – 30.09.2021

Project partners

Institutions taking part in the project	Acronym	Institution type	Role in the project
National Institute for Research and Development for Chemistry and Petrochemistry ICECHIM, Bucharest	ICECHIM	INCD	Complex project coordinator
„Ovidius” University, Constanta	UOC	UNI	Partner P1
Institute of Physical Chemistry - Ilie Murgulescu, Bucharest	ICF	IA	Partner P2
VALAHIA University,Targoviste	UVT	UNI	Partner P3

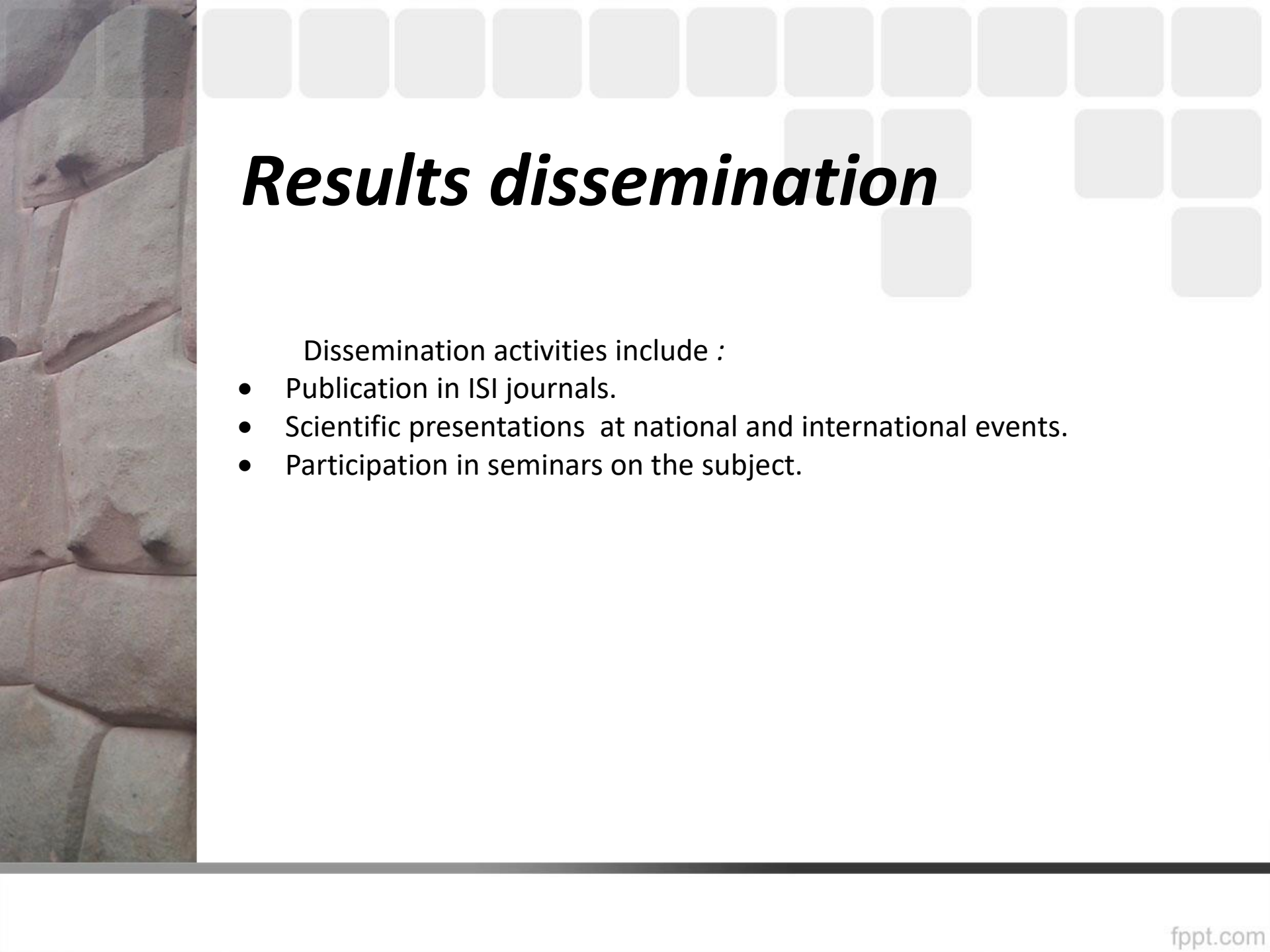
Project objectives

- establish collaboration between research groups from one National Institute for Research and Development (ICECHIM), two Universities (Ovidius University Constanta and Valahia University, Targoviste) with renowned institutional tradition and performance and one renowned institute of the Romanian Academy (ICF)
- the coordinated activity aims to elaborate synthesis technologies for novel advanced protective materials, respecting principles of authenticity, reversibility and value, with strong impact on immobile patrimony objects (frescoes, metope and mosaiques) and mobile patrimony objects (ceramic decorative artifacts, glass, metal, bone, art and archeological objects) and develop new techniques to be applied on the following sites: Roman Mosaique and Hypogeum Tomb in Constanta, Adamclisi Museum (metope) in Constanta County, Corvin Castle (Loggia Mathia Fresco) and Archeology Museum, Hunedora.

<i>Luminita Predoana</i>	<i>Cercetator st. CSII</i>	<i>Project leader</i>
Fruth Victor	Cercetator st. CSI	Expert Researcher
Atkinson Irina	Cercetator st. CSIII	Expert Researcher
Marinescu Gabriela	Cercetator st. CSI	Expert Researcher
Culita Daniela	Cercetator st. CSII	Expert Researcher
Gingasu Dana	Cercetator st. CSII	Expert Researcher
Mindru Ioana	Cercetator st. CSII	Expert Researcher
Anghel Elena Maria	Cercetator st. CSII	Expert Researcher
Stroescu Hermine	Cercetator	Researcher
Mocioiu Oana	Cercetator st. CSIII	Researcher
Pandele Cusu Jeanina	Cercetator st. CSIII	Researcher
Mitran Raul	Cercetator st. CSIII	Researcher
Todan Ligia	Cercetator st. CSII	Expert Researcher
Petrescu Simona	Cercetator st. CSIII	Researcher
Ciobanu Madalina	Cercetator st. CSIII	PhD Candidate
Bratan Veronica	Cercetator st. CSIII	Researcher
Aricon Ludmila	Cercetator st.	PhD Candidate
Leontieș Anca Ruxandra	Cercetator st.	Researcher
Preda Silviu	Cercetator st.	Researcher
Rusu Adriana	Cercetator st.	Researcher
Vladut Cristina	Asistent cercetare	PhD Candidate
Petcu Gabriela	Doctorand	PhD Candidate
Toma Valentin	Tehnician	Assistant Researcher
Poenaru Iuliana (2018-2019) / Codrea Cosmin Iulian (2020-2021)	Cercetator	PhD Candidate

Budget

Year	Budget estimate (lei)		Total (lei)
	Budget	Checks	
2018	301587	20961	322548
2019	313983	22201	336184
2020	363784	11227	375011
2021	60326	1861	62187
Total	1039680	56250	1095930



Results dissemination

Dissemination activities include :

- Publication in ISI journals.
- Scientific presentations at national and international events.
- Participation in seminars on the subject.

Results dissemination

Awards, medals, distinctions obtained through the selection process

1. R.M. Ion, D. Turcanu-Carutiu, L. Predoana, C. Radulescu, New diagnosis and treatment technologies for the conservation and revitalization of archeological components from national cultural heritage, Diploma of silver medal, EUROINVENT, Iasi, Romania, 16 - 18 May 2019.
2. R.M. Ion, D. Turcanu-Carutiu, L. Predoana, C. Radulescu, New diagnosis and treatment technologies for the conservation and revitalization of archeological components from national cultural heritage, Diploma de Excelenta, INVENTICA, Iasi, Romania, 29 - 31 Iulie 2020.

Presentations for participation in international and national conferences

- 1) Oral presentation with title *Multifunctional composite coatings with self-cleaning and antimicrobial properties containing oxide nanopowders* authors Victor Fruth, Luminita Predoana, Iuliana Poenaru, Ligia Todan, Ludmila Aricov, Gabriela Petcu, Hermine Stroescu, Iuliana Radut, Mariana Calin, Luiza Jecu at the conference 5th Conference of the Serbian Society for Ceramic Materials 5CSCS-2019 11th – 13th June, 2019
- 2) Poster presentation with title *Thermal behaviour of the TiO₂ powders obtained by microwave-assisted sol-gel method*, authors Luminita Predoana, Jeanina Pandele Cusu, Simona Petrescu, Silviu Preda at the conference 2nd Journal of Thermal Analysis and Calorimetry Conference (2nd JTACC+V4 2019) June 18-21, 2019 at Budapest, Hungary.
- 3) Poster presentation with title *Composite coatings based on sol-gel MgO or TiO₂ oxide nanopowders for buildings and monuments protection*, authors Victor Fruth, Iuliana Poenaru, Ligia Todan, Ludmila Aricov, Madalina Ciobanu, Luiza Jecu, Rodica Ion, Luminita Predoana at the conference The XX International Sol-gel Conference, 25-30 august 2019, St. Petersburg, Russia
- 4) Oral presentation with title *"Multifunctional Metal-Oxide-Nanopowder-Polymer Composite Coatings for Stone Built Heritage Conservation"* authors : Victor Fruth, Luminita Predoana, Iuliana Poenaru, Ligia Todan, Ludmila Aricov, Madalina Ciobanu, Luiza Jecu, Rodica Ion at the conference PRIOCHEM XV – 2019, Bucharesti, 30 October - 01 November 2019, Romania

National patent application with title *Procedeu de obținere a unor pelicule nanocompozite destinate protejării componentelor arhitecturale litice ale patrimoniului cultural*. **OSIM nr. A/00350/10.06.2019 Grant of invention patent no. 134390 August 2021**

Results dissemination

Book chapter

1. Luminita Predoana, Irina Stanciu, Maria Zaharescu; Metal oxide nanomaterials obtained by sol-gel and microwave assisted sol-gel methods, in book titled 'Advances in Microelectronics: Reviews' Book Series, Vol. 2 Prof dr. Sergey Y. Yurish, chapter 7 *Metal Oxide Nanomaterials Obtained by Sol-gel and Microwave Assisted Sol-gel Methods*, Published by International Frequency Sensor Association (IFSA) Publishing, S. L, Spain, ian 2019, ISBN: 978-84-09-08160-8, page 221-249

Papers in preparation

1. Victor Fruth, Ligia Todan, Cosmin iulian Codrea, Ludmila Aricov, Madalina Ciobanu, Iuliana Poenaru, Luiza Jecu, Rodica Ion, Luminita Predoana, *Composite coatings based on sol-gel MgO or TiO₂ oxide nanopowders for buildings and monuments protection*, being drafted
2. Jeanina Pandele-Cusu, Simona Petrescu, Silviu Preda, Luminita Predoana, *Thermal behavior of the TiO₂ powders obtained by microwave-assisted sol-gel method*, being drafted will be sent for publication in the Journal of Thermal Analysis and Calorimetry
3. Claudiu Eduard Rizescu, Diana Alexandra Mine, Irina Atkinson, Adriana Rusu, Luminita Predoana, Raluca-Maria Stirbescu, Anca Irina Gheboianu, Rodica Mariana Ion, CaAl - layered double hydroxides for heritage conservation - preparation, characterization and kinetic stability of their dispersion in solvent