

Dr. Davide Carboni (PhD)



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PUBLONS: <https://publons.com/researcher/J-6365-2015/>

RESEARCH ACTIVITY

Assistant Professor of Materials Science (RTDa)

1st February 2022 – Present

Laboratory of Materials Science and Nanotechnology (LMNT),
Department of Biomedical Sciences - UNISS

Research Collaborator

June 2016 – May 2018

Laboratory of Materials Science and Nanotechnology (LMNT)
Department of Chemistry and Pharmacy - University of Sassari

Post-doc with teaching duties in Materials Science

February 2016 – May 2016

Laboratory of Materials Science and Nanotechnology (LMNT)
D.A.D.U.- University of Sassari

Teaching: **Materials Science; Nanotechnology; Materials for Design; Materials and Manufacturing.**

Assistant Professor of Materials Science (3 years contract RTDa)

27 December 2012 - 26 December 2015

Synthesis of novel hybrid mesostructured nanomaterials for energy and environmental applications.

Laboratory of Materials Science and Nanotechnology (LMNT),
Funded by the Sardinian Regional Government (R.A.S.) through P.O.R/F.E.S.R 2007-13

The project focussed on studying different types of mesostructured nanomaterials for developing functional coatings (mostly hybrids) used in energy and environmental applications. In particular, the use of graphene in different oxidation states (exfoliated graphene, Graphene Oxide and reduced Graphene Oxide) allows exploiting the Graphene-mediated Enhancement of Raman Scattering (**GERS**) of these nanostructured materials for environmental sensing applications (i.e. detection of highly toxic organic pollutants such as organic dyes and commercial organophosphates). Moreover, the synthesis of new nanostructured materials embedding Carbon dots allows tuning the fluorescent emission of some hybrid materials to develop new solid-state emitting devices. Use of partially fluorinated compounds to enhance the photocatalytic activity of low-temperature processed titania films.

Research Fellow in Nanomaterials

19 April 2010 - June 2012

Catalytic mesoporous nanomaterials for pesticides hydrolysis.

Hosted by Laboratory of Materials Science and Nanotechnologies (LMNT),
D.A.D.U.- University of Sassari.

Personal Fellowship awarded by the Sardinian Regional Government (R.A.S.) through L.R. 7/2007

The project focused on the development of novel composite materials, such as organically coated SPIONs (Super Paramagnetic Iron Oxide Nanoparticles) and hierarchical mesoporous thin films possessing catalytic activity towards pesticides, inspired by an enzyme-mimic approach and obtained *via* sol-gel chemistry through a combination of evaporation induced self-assembly (EISA) and/or high dilution radical polymerisation processes.

Research Associate in Physical Organic Chemistry

21st July 2009 - 6th April 2010

Study of Ring Closing Metathesis of α - ω -dienes catalysed by 2nd generation Grubbs pre-catalyst

Department of Pure and Applied Chemistry - WestChem, University of Strathclyde, Glasgow
Supervisor: Prof. J. M. Percy,
Funded by EPSRC Initiative in Physical Organic Chemistry

The project focused on the study of the relationship between structure and reaction rates in ring closing metathesis (RCM) of α - ω -dienes catalysed by 2nd generation Grubbs (GII) pre-catalyst. This study was performed mainly by mean of NMR (¹H-NMR, ¹³C-NMR, COSY) and GC-MS techniques in order to identify all the species involved in the catalytic process and to develop kinetic models suitable to describe and predict the experimental behaviours of RCM reactions.

EDUCATION

PhD in Chemistry

September 2005 - September 2008

Synthesis and characterisation of molecularly imprinted nanogels with Aldolase type I activity

School of Biological and Chemical Sciences (SBCS),

PhD Viva held on 7th of Sep 2009

Queen Mary, University of London (UK).

PhD Awarded on 31st of Jan 2010

Supervisor: Prof. M. Resmini,

Co-funded by Glaxo Smith Kline (**GSK**) and Queen Mary (**QMUL**).

The project focused on the development of new enzyme mimics nanomaterials using the *molecular imprinting* approach. The work was carried out using nanogels as the polymer format and the targeted reaction was the C-C bond formation of a cross-aldol reaction. The strategic design of the template and the use of a specific functional monomer allowed the formation of a covalent structure capable of generating imprinted nanogels. The template removal allowed obtaining molecular cavities exhibiting a catalytic activity mimicking the corresponding Aldolase type I enzyme. An extensive study was also performed to compare the different catalytic behaviour of the organocatalyst, used as functional monomer, when inserted into the imprinted polymer and when used in solution.

Laurea in Chemistry (5 years) (marks 110/110)

16th of March 2005

MSc Thesis Project at Institute of Biomolecular Chemistry of CNR (ICB-CNR).

October 2003 – March 2005

Faculty of Mathematics, Physics and Natural Sciences

Chemistry Department - University of Sassari, Sardinia, Italy

Supervisors: Prof. S. Gladiali (Chemistry Department) and Dr. M. Marchetti (ICB-CNR)

FUNDING AND MANAGEMENT

- In **2010** I have been awarded a 2 years personal Research Fellowship from the Sardinian Regional Government (R.A.S.) (**70000 €**), as a results of a successful application made as a PI with a research proposal concerning the development of novel molecularly imprinted mesoporous nanomaterials for pesticides hydrolysis.
- In **2011** I have written a joint research proposal as co-Investigator, for an industrial tech-transfer, with a small company working on water remediation. The project was based on the development of new nanomaterials for wastewater remediation. In **2012** this project was funded by the Sardinian Regional Government (R.A.S.) with a grant covering a 2 years post-doctoral position that I have co-supervised.
- Between **2013** and **2015** I have contributed to write successful applications for several beam-time slots of the Small Angle X-Ray Scattering (SAXS) and Deep X-Ray Lithography (DXRL) beamlines at Elettra synchrotron light source.
- During the time spent at LMNT I was also actively involved in writing several grants and research proposal for the Laboratory of Materials Science and Nanotechnology for both industrial and/or academic collaborations.
- For a period of 5 months (April 2013-September 2013) I had the responsibility of the research group and related activities (teaching and exams) while the senior members where involved in activities abroad (China and Australia).

TEACHING EXPERIENCE

Lecturer of Innovative Materials and Nanotechnology at 3rd year of Industrial Engineering, UNISS (1st Semester 2024-25)

Lecturer of Materials Science at 2nd year of Industrial Engineering, UNISS (2nd Semester A.A. 2023-24/2024-25)

Supervision and Lab-based support for Students (2022-present)

During my time at LMNT, University of Sassari, as Assistant Professor, I have enjoyed giving my contribution in supervising, actively, younger members of the group (Masters and PhD), and postdoctoral assistants, both in the lab-based work and in writing reports, thesis and papers as well as in preparing both oral and poster presentations. In particular, I have taken care of three Russian Master students from St. Petersburg (ITMO University), a Hungarian Researcher, came at LMNT with an **Erasmus Plus** partnership, and a visiting Persian PhD from Ferdowsi University of Mashhad (Iran).

Lecturer of Materials Science (2013-present)

As a part of my teaching duties, in **2013** I have been asked from the Head of my Department to design and teach a course of **Materials Selection** (*Introduzione ai Materiali per il Design*) (**ING-IND/22**). In **2015** I have designed and provided another course, **Materials for Design: Materials & Manufacturing** (*Materiali per il Design: Materiali e Manifattura*) (**ING-IND/22**), to expand the topic of applied Materials Science. I have been in charge of these two courses until **September 2017**, teaching to classes of about 20-25 students (the small number depends on the closed enrolment policy of our department). Since I have been teaching to both Italian and foreigner students (mainly **Erasmus** students from different European countries but also Asian students), I have always prepared my slides in English though I have been asked to teach only in Italian. I have also provided the students with digital

copies of the slides as a teaching support. With regard to the final examinations, I have always allowed the students to give the examination either in Italian or English (and sometimes both). A blind evaluation of these two courses has always gained very high marks from the students with a growing reputation among them.

Supervision and Lab-based support for Chemistry Students (2005-2017)

During the time spent at LMNT, University of Sassari, as Research Fellow before and Assistant Professor later, I have enjoyed giving my contribution in supervising, actively, younger members of the group (Masters and PhD), and postdoctoral assistants, both in the lab-based work and in writing reports, thesis and papers as well as in preparing both oral and poster presentations. I have also provided them with pastoral support especially to the foreigner PhD students (Chinese and Japanese).

Previous experiences covered demonstrations of practical classes and workshops (organic, analytical, physical and forensic chemistry) to undergraduate students with responsibility for groups of up to 30 students. Lab-based support for MSc students in their final year projects and Master students during PhD at QMUL and also supervision of 4 PhDs and 4 BScs students in their final year projects while Research Associate at University of Strathclyde.

KEY TECHNICAL SKILLS

- Development of first organic-inorganic hybrid platforms embedding exfoliated graphene and characterised by molecularly imprinted cavities for selective and quantitative determination of organic pollutants in environmental matrices using Graphene Enhanced Raman Scattering (GERS) and Graphene-mediated Surface Enhanced Raman Scattering (G-SERS).
- Synthesis of hybrid materials containing graphene (exfoliated, oxide and reduced oxide) from liquid phase deposition and characterisation of their mechanical properties through nanoindentation and their sensing properties through Raman spectroscopy by exploiting the enhancement of Raman scattering. Use of Small angle X-Ray Scattering (SAXS) for *in situ* investigation of mesostructure organisation in crystalline and amorphous hybrid materials and use of Deep X-ray Lithography (DXRL) to evaluate the influence of Hard X-Ray exposure to mesostructured nanocomposite materials.
- Synthesis of composite mesoporous materials using sol-gel techniques, film deposition by dip-coating and their chemo-physical characterisation through various techniques: UV-Vis Spectroscopy, Infrared Spectroscopy (FT-IR), Fluorescence Spectroscopy, Spectroscopic Ellipsometry, Dynamic Light Scattering (DLS), Atomic Force Microscopy (AFM). X-Ray Diffraction (XRD), Raman Spectroscopy, micro-X-Ray Fluorescence, DSC/DTA, Porosimetry (BET) and Contact Angle. Kinetic characterisation of catalytic activity of heterogeneous catalysts (thin films on Silicon/Glass) or colloidal dispersions (SPIONs magnetic fluids) by UV-Vis spectroscopy.
- Kinetic study of ring closing metathesis (RCM) reactions of simple dienes performing an *in situ* quantitative analysis of the reaction progress monitored by NMR-spectroscopy (^1H -NMR, ^{13}C -NMR, COSY). Quantitative analysis of the experimental data with dedicated software (Berkeley-Madonna, KinTek Explorer). Ability in handling air sensitive compounds under inert atmosphere (nitrogen, argon).
- Synthesis, purification, recrystallisation, and characterisation of organic molecules. Expertise in UV-Vis, NMR-spectroscopy (^1H -NMR, ^{13}C -NMR, COSY), LC-MS. Method development and use of HPLC (NP chiral and RP). Synthesis by high dilution radical polymerisations, recovery and characterisation of *molecularly imprinted polymers* (MIP) in nanogel format. Kinetic characterisation of the catalytic activity of the colloidal nanogel dispersions by HPLC-RP and related data analysis. Development of a dedicated active site titration protocol by using chemical reactions.
- Synthesis of organic molecules with various techniques, including setup of hazardous reactions at high syngas pressures (hydroformylation and hydrogenation) under inert conditions using mostly Rh-complexes, their purification by flash chromatography and recrystallization; characterisation of the organic compounds mainly by NMR-spectroscopy (^1H -NMR, ^{13}C -NMR, COSY) and GC-MS. Multistep synthesis of biologically active compounds using a convergent synthetic approach.

EVIDENCE OF PEER ESTEEM

Main Talks and Posters at International Conferences

- Invited talk at *IPCOS Summer School*, Alghero (**Italy**), 10th-13th September **2017**.
- *Poster at XIX International Sol-Gel Conference*, Liege (**Belgium**) 3rd- 8th September **2017**.
- **Excellent Poster Award** at *XVIII International Sol-Gel Conference*, Kyoto (**Japan**), 6th-11th September **2015**.
- Invited talk at *V NANODRUG Scientific Meeting*, Alghero (**Italy**), 27th June - 1st July, **2015**.
- Oral presentation at *X International Conference on SiO₂ – Advanced Dielectrics and Related Devices*, Cagliari (**Italy**) 16th- 18th June **2014**.

- Oral presentation at 2014 EMRS-Spring Meeting, Symposium B: Advanced functional materials for environmental monitoring and applications, Lille (France) 26th-30th May 2014.
- Poster presentation at XVI International Sol-Gel Conference in Hangzhou (China) 28th August – 2nd September 2011.
- XV Symposium on Organometallic Chemistry Directed Towards Organic Synthesis (OMCOS 15), Glasgow (UK), 26th-30th July 2009.
- Poster presentation at V International Conference on Molecular Imprinting, Kobe University (Japan), 7th-11th September 2008.

Reviewer Activity and Memberships

- Peer reviewer activity for journals published by **Wiley** (ChemSusChem and ChemCatChem, J. Mol. Recognit.), **RSC** (J. Mater. Chem. B and NJC), **Springer** (J. Nanostructures in Chemistry, J. Nanoparticles Res.) and **Elsevier** (J. Mol. Structure). More details on Publons: <https://publons.com/researcher/J-6365-2015/>
- Member of the **National Interuniversity Consortium of Materials Science and Technology (INSTM)** and the **Society for Molecular Imprinting (SMI)**. Former member of the **International Institute for Nano/Meso Materials Science**, Osaka Prefecture University, Sakai, Osaka, Japan.
- In **July 2017** award of the Italian **National Scientific Habilitation (ASN, Abilitazione Scientifica Nazionale)** for Associate Professor of Materials Science (09/D1-ING_IND/22).

LIST OF PUBLICATIONS

1. L. Stagi, **D. Carboni**, R. Anedda, R. Popescu, Y. Eggeler, L. Calvillo, A. Pramanik, A. Sciortino, M. Cannas, F. Messina L. Malfatti, One-Step Fabrication of Carbon Dot-Based Nanocomposites Powering Solid-State Random Lasing, *Small Structures*, **2024**, 2400498. <https://doi.org/10.1002/sstr.202400498>
2. **D. Carboni***, M. Cadeddu, L. Stagi, R. Anedda, L. Malfatti and P. Innocenzi. Structural insights into low temperature copolymerisation of thermodegradable amino acids mediated by pyroglutamic acid, *Macromolecules*, **2024**, DOI [10.1021/acs.macromol.4c00614](https://doi.org/10.1021/acs.macromol.4c00614). **Front Cover Awarded**
3. L. Malfatti, M. Poddighe, L. Stagi, **D. Carboni**, R. Anedda, M. F. Casula, B. Poddesu, D. De Forni, F. Lori, S. Livraghi, A. Zollo, L. Calvillo, P. Innocenzi, Visible Light Activation of Virucidal Surfaces Empowered by Pro-Oxidant Carbon Dots. *Adv. Funct. Mater.*, **2024**, 2404511. DOI [10.1002/adfm.202404511](https://doi.org/10.1002/adfm.202404511)
4. L. Fois, L. Stagi, **D. Carboni**, M. Alboushi, A. Khaleel, R. Anedda, P. Innocenzi. The Formation of Carbon Dots from D-glucose Studied by Infrared Spectroscopy, *Chem. Eur. J.*, **2024**, e202400158.
5. M. Cadeddu, **D. Carboni***, L. Stagi, L. Malfatti, M. F. Casula, F. Caboi and P. Innocenzi. Design of Dual-Emitting Nonaromatic Fluorescent Polymers through Thermal Processing of L-Glutamic Acid and L-Lysine. *Macromolecules*, **2024**, 57(2), 514–527.
6. L. Stagi, L. Malfatti, A. Zollo, S. Livraghi, **D. Carboni**, D. Chiriu, R. Corpino, P. C. Ricci, A. Cappai, C. M. Carbonaro, S. Enzo, A. Khaleel, A. Adamson, C. Gervais, A. Falqui, P. Innocenzi, Phosphorescence by Trapping Defects in Boric Acid Induced by Thermal Processing. *Adv. Optical Mater.*, **2024**, 12, 2302682. <https://doi.org/10.1002/adom.202302682>
7. F. Fiori, F. L. Cossu, F. Salis, **D. Carboni**, L. Stagi, D. De Forni, B. Poddesu, L. Malfatti, A. Khaleel, A. Salis, M.F. Casula, R. Anedda, F. Lori and P. Innocenzi. In Vitro Antiviral Activity of Hyperbranched Poly-L-Lysine Modified by L-Arginine Against Different SARS-CoV-2 Variants. *Nanomaterials*, **2023**, 13, 3090.
8. J. De Santis, J.; Paolucci, V.; Stagi, L.; **D. Carboni**, D.; Malfatti, L.; Cantalini, C.; Innocenzi, P. Bidimensional SnSe₂—Mesoporous Ordered Titania Heterostructures for Photocatalytically Activated Anti-Fingerprint Optically Transparent Layers. *Nanomaterials*, **2023**, 13, 1406. <https://doi.org/10.3390/nano13081406>
9. L. Stagi, M. Sini, **D. Carboni**, R. Anedda, G. Siligardi, T-M. Gianga, R. Hussain and P. Innocenzi, Modulating the poly-L-lysine structure through the control of the protonation-deprotonation state of L-lysine, *Sci Rep.*, **2022**, 12, 19719.
10. J. Ren, L. Malfatti, L. Stagi, **D. Carboni**, R. Anedda, L. Calvillo and P. Innocenzi, Polyethylene Glycol-Mediated Switchable Blue-Green Emissions in Sulfur Nanostructures Controlled through the Surface Chemistry, *Chem. Mater.*, **2022**, *Chem. Mater.* **2022**, 34, 18, 8456–8468.
11. F. Radica, S. Mura, **D. Carboni**, L. Malfatti, S. Garroni, S. Enzo, G. Della Ventura, G. Tranfo, A. Marcelli, P. Innocenzi, Phenyl-modified hybrid organic-inorganic microporous films as high efficient platforms for styrene sensing, *Microporous and Mesoporous Materials*, **2020**, 294, 109877.
12. Y. Jiang, **D. Carboni**, L. Malfatti, P. Innocenzi, Graphene Oxide-Silver Nanoparticles in Molecularly-Imprinted Hybrid Films Enabling SERS Selective Sensing. *Materials* **2018**, 11 (9), 1674.
13. Y. Jiang, J. Wang, L. Malfatti, **D. Carboni**, N. Senes and P. Innocenzi, Highly durable graphene-mediated surface enhanced Raman scattering (G-SERS) nanocomposites for molecular detection, *Applied Surface Science*, **2018**, 450, 451–460.
14. **D. Carboni**, Y. Jiang, L. Malfatti and P. Innocenzi, Selective detection of organophosphate pesticides in water through graphene-based molecularly imprinted hybrid platforms, *J. Raman Spectr.*, **2018**, 49, 189-197. Published on Special Issue “*Raman study of graphene and related materials*”.

15. P. Rasso, L. Malfatti, **D. Carboni**, M. Casula, S. Garroni, E. Zampetti, A. Macagnano, A. Bearzotti e P. Innocenzi, Mesoscale organization of titania thin films enables oxygen sensing at room temperature, *J. Mater. Chem. C*, **2017**, 5, 11815- 11823
16. K. Suzuki, L. Malfatti, M. Takahashi, F. Messina, M. Takemoto, Y. Tokudome, **D. Carboni** and P. Innocenzi, Design of Carbon Dots Photoluminescence through Organo-Functional Silane Grafting for Solid-State Emitting Devices, *Sci. Rep.*, **2017**, 7, 5469.
17. Y. Jiang, **D. Carboni**, L. Malfatti and P. Innocenzi, Greener Chemistry for Hybrid Materials: Alcohol-Free Synthesis with an Epoxy-Cyclohexyl Precursor, *Macromol. Mater. Eng.*, **2017**, 302, 1600394.
18. L. Malfatti, **D. Carboni**, P. Innocenzi, (2016) Graphene and Carbon Dots in Mesoporous Materials. In: L. Klein, M. Aparicio, A. Jitianu (eds) **2016**, *Handbook of Sol-Gel Science and Technology*. Springer, Cham. https://doi.org/10.1007/978-3-319-19454-7_150-1 (*Invited*).
19. **D. Carboni**, Y. Jiang, M. Faustini, L. Malfatti and P. Innocenzi, Improving the selective efficiency of graphene-mediated enhanced Raman scattering through molecular imprinting, *ACS Appl. Mater. Interfaces*, **2016**, 8 (49), 34098–34107.
20. **D. Carboni**, B. Lasio, L. Malfatti and P. Innocenzi, Magnetic core-shell nanoparticles coated with a molecularly imprinted organogel for organophosphate hydrolysis, *J. Sol-Gel Sci. Technol.*, **2016**, 79, 395–404. (*Invited*)
21. D. Loche, L. Malfatti, **D. Carboni**, V. Alzari, A. Mariani and M. Casula, Incorporation of graphene into silica-based aerogels and application for water remediation, *RSC Advances*, **2016**, 6, 66516–66523.
22. L. Malfatti, **D. Carboni**, A. Pinna, B. Lasio, B. Marmiroli, P. Innocenzi, In situ growth of Ag nanoparticles in graphene/TiO₂ mesoporous films induced by hard X-ray, *J. Sol-Gel Sci. Technol.*, **2016**, 79, 295–302.
23. Y. Tokudome, H. Kuniwaki, K. Suzuki, **D. Carboni**, G. Poologasundarampillai M. Takahashi, Thermo-responsive wrinkles on hydrogels for soft actuators, *Adv. Mater. Interfaces*, **2016**, 3, 1500802-6. **Front Cover Awarded**
24. Y. Jiang, **D. Carboni**, A. Pinna, B. Marmiroli, L. Malfatti and P. Innocenzi, Hard X-rays for processing of hybrid organic-inorganic thick films, *J. Synchrotron Radiat.*, **2016**, 23, 267-273.
25. **D. Carboni**, B. Lasio, D. Loche, M. F. Casula, A. Mariani, L. Malfatti and P. Innocenzi, Introducing Ti-GERS: Raman Scattering Enhancement in Graphene-Mesoporous Titania Films, *J. Phys. Chem. Letters*, **2015**, 6, 3149-3154.
26. P. Innocenzi, L. Malfatti and **D. Carboni**, Graphene and carbon nanodots in mesoporous materials: an interactive platform for functional applications, *Nanoscale*, **2015**, 7, 12759-12772.
27. P. Innocenzi, L. Malfatti, **D. Carboni**, M. Takahashi, Sol to gel silica transition in fast evaporating systems observed by in situ time resolved infrared spectroscopy, *Chem. Phys. Chem.*, **2015**, 16, 1933-1939.
28. **D. Carboni**, A. Pinna, H. Amenitsch, M. F. Casula, L. Malfatti and P. Innocenzi, Getting order in mesostructured thin films, from pore organization to crystalline walls, the case of 3-glycidoxypropyltrimethoxysilane, *Phys. Chem. Chem. Phys.*, **2015**, 17, 10679-10686.
29. K. Suzuki, L. Malfatti, **D. Carboni**, D. Loche, M. F. Casula, A. Moretto, M. Maggini, M. Takahashi, and P. Innocenzi, Energy Transfer Induced by Carbon Quantum Dots in Porous Zinc Oxide Nanocomposite Films, *J. Phys. Chem. C*, **2015**, 119, 2837.
30. **D. Carboni**, B. Lasio, V. Alzari, A. Mariani, D. Loche, M. F. Casula, L. Malfatti, and P. Innocenzi, Graphene-mediated surface enhanced Raman scattering in silica mesoporous nanocomposite films, *Phys. Chem. Chem. Phys.*, **2014**, 16, 25809.
31. A. Pinna, B. Lasio, **D. Carboni**, S. Marceddu, L. Malfatti, and P. Innocenzi, Engineering the surface of hybrid organic-inorganic films with orthogonal grafting of oxide nanoparticles, *J. Nanopart. Res.*, **2014**, 16, 2463–11.
32. **D. Carboni**, D. Marongiu, P. Rasso, A. Pinna, H. Amenitsch, M. Casula, A. Marcelli, G. Cibir, P. Falcaro, L. Malfatti, and P. Innocenzi, Enhanced Photocatalytic Activity in Low-Temperature Processed Titania Mesoporous Films, *J. Phys. Chem. C*, **2014**, 118, 12000.
33. **D. Carboni**, A. Pinna, L. Malfatti, and P. Innocenzi, Smart tailoring of the surface chemistry in GPTMS hybrid organic-inorganic films, *New J. Chem.*, **2014**, 38, 1635.
34. **D. Carboni**, L. Malfatti, A. Pinna, B. Lasio, Y. Tokudome, M. Takahashi, and P. Innocenzi, Molecularly imprinted La-doped mesoporous titania films with hydrolytic properties toward organophosphate pesticides, *New J. Chem.*, **2013**, 37, 2995. **Front Cover Awarded**
35. L. Malfatti and **D. Carboni**, From nanoscience to nanoethics: the viewpoint of a scientist, *Ethics & Politics*, **2013**, 15, 303.
36. D. Marongiu, **D. Carboni**, L. Malfatti and P. Innocenzi, Pore-confined synthesis of mesoporous nanocrystalline La-Ce phosphate films for sensing applications, *J. Mater. Chem.*, **2012**, 22, 20498.
37. M. Resmini, K. Flavin and **D. Carboni**, Microgels and Nanogels with catalytic activity, *Book chapter* in **Molecular Imprinting**, Karsten Haupt Editor, *Topics in Current Chemistry*, **2012**, 325, 307-342, Springer-Verlag Berlin Heidelberg.

38. D. J. Nelson, **D. Carboni**, I. W. Ashworth, and J. M. Percy, Toward a Simulation Approach for Alkene Ring-closing Metathesis: Scope and Limitations of a Model for RCM, *J. Org. Chem.*, **2011**, 76, 8386.
39. I. W. Ashworth, **D. Carboni**, I. H. Hillier, D. J. Nelson, J. M. Percy, G. Rinaudo, Mark A. Vincent, On the relationship between structure and reaction rate in olefin ring-closing metathesis, *Chem. Commun.*, **2010**, 46, 7145.
40. **D. Carboni**, K. Flavin, A. Servant, V. Gouverneur, M. Resmini, First Example of molecularly imprinted nanogel with Aldolase type I activity, *Chem. Eur. J.*, **2008**, 14, 7059. (I.F. 2020 **5.2**)
41. M. Marchetti, S. Paganelli, **D. Carboni**, F. Ulgheri, G. Del Ponte, Synthesis of indole derivatives by domino hydroformylation/indolization of 2-nitrocinnamaldehydes, *J. Mol. Cat. A: Chem.*, **2008**, 288, 103.