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## Chimie

Doina Lutic and Ioana Fechete

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Volume 25, Special Issue S3 (2022), p. 1-3

Issue date: 6 September 2022

<https://doi.org/10.5802/crchim.197>

**Part of Special Issue:** Active site engineering in nanostructured materials for energy, health and environment

**Guest editors:** Ioana Fechete (Université de Technologie de Troyes, France) and Doina Lutic (Al. I. Cuza University of Iasi, Romania)

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*Les Comptes Rendus. Chimie* sont membres du  
Centre Mersenne pour l'édition scientifique ouverte  
[www.centre-mersenne.org](http://www.centre-mersenne.org)  
e-ISSN : 1878-1543

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# Foreword to “*Active site engineering in nanostructured materials for energy, health and environment*” dedicated to Professor Emil Dumitriu

Doina Lutic<sup>a</sup> and Ioana Fechete<sup>\*, b</sup>

<sup>a</sup> Faculty of Chemistry, Alexandru Ioan Cuza University of Iasi, Romania

<sup>b</sup> Université de Technologie de Troyes, France

*E-mails:* [doilub@yahoo.com](mailto:doilub@yahoo.com) (D. Lutic), [i\\_fechete@yahoo.com](mailto:i_fechete@yahoo.com) (I. Fechete)

*Issue date:* 6 September 2022



Emil Dumitriu (photograph by Brindusa Dragoi)

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\* Corresponding author.

Professor Emil Dumitriu was born in Focșani, Romania, on December 5th 1946. He graduated the “Unirea” college from this city in 1964, then he studied chemical engineering at the Polytechnic Institute (nowadays, the Technical University) “Gheorghe Asachi” from Iasi, Romania, graduated in 1971. The first engineer job was a position of beginner researcher at Petru Poni” Macromolecular Chemistry Institute from Iași, the subsidiary of the Romanian Academy, in the Laboratory of Reactive Polymers. Here he started the research activity related to his PhD thesis. In 1980, he defended the thesis entitled: “Contributions to the study of acrylic monomers reactivity in radical copolymerization” at “Petru Poni” Institute of Macromolecular Chemistry Iasi, under the advisory of Professor Mihai Dima.

Between 1975–1976, we worked at the Institute for Design in Chemical Industry, the subsidiary from Iași, an unit specialized in the detailed planning designs for high-scale chemical industry facilities. Despite the high requirements of work rigor and competence, it comprised mostly routine work, while the innovating spirit of Professor Dumitriu needed something more challenging. From 1976, he became after a competition, teaching assistant at the Department of Organic Compounds Industry, at the Faculty of Industrial Chemistry of the Polytechnic Institute “Gheorghe Asachi” from Iași. He promoted on a lecturer position in 1980 and became associated professor in 1990. In 1990, he earned the quality of PhD adviser and in 1991, he promoted on a full professor position in the Department of Organic and Biochemical Engineering, which he has held until 2011, when he became *Professor emeritus*.

In the research activity, Professor Emil Dumitriu was the initiator and successful promoter of the Catalysis school at the Faculty of Industrial Chemistry and Environmental Protection, reorganized after 1990. The small research group from the early beginning of the catalysis research in Iași increased in time and, even more important, the research quality noticed important distinction during the mentoring of Professor Dumitriu.

His PhD students learned the scientific rigor, accustomed a hard work style and even discovered a special research beauty under the advisory of Professor Emil Dumitriu. His early research areas comprised the synthesis and detailed characterization of several classes of catalysts containing microporous

materials (zeolites and non-zeolitic molecular sieves of aluminophosphate-type) as well as heterogeneous catalysis applications thereof in organic chemistry reactions with potential large scale applications. The catalytic reactions performing at laboratory scale using the available research infrastructure in the last decade of the 20th century in Romania required a lot of self-designed and manufactured reactors and peripheral accessories. A notable number of valuable scientific papers from this early catalysis research period, published however in well ranked journals, were elaborated based on results obtained on versatile complex setups, entirely designed and build up by Professor Dumitriu himself, with the support of some close collaborators. In time, the laboratory infrastructure enrichment and improvement was possible by applying for national research grants.

Professor Emil Dumitriu stood out as prominent figure in the Romanian and international scientific community, by his outmost contributions in the fields of catalytic materials synthesis and their applications in organic reactions, petrochemical industry and green chemistry. The main topics addressed in catalysts development comprise: micro- and mesoporous and lamellar materials, functionalization and modification of surfaces, oxide and metal nanoparticles on functionalized mesostructured supports, redox and acid–base catalysts, complex nanocomposites for drugs and pesticides controlled delivery. The organic chemistry reactions covered by his activity include the aromatic hydrocarbons interconversion, fine organic synthesis in heterogeneous systems (aldol condensation, selective hydrogenation, aromatics alkylation), biocatalysts-mediated reactions, catalytic conversion of biomass-derived compounds.

15 PhD students elaborated and defended their thesis under his advisory, some of them being nowadays professors and research mentors themselves. His personality, combining rich knowledge, excellent communication skills, good mastering of English and French, combined always with patience, sometimes with severity and constant elite scientific level cultivation was always a good premise for modelling both professional competence and personality of his disciples.

Professor Dumitriu was the director or head for more than 63 research and development projects, 3 of them within international collaborations. He is co-author of 3 patents and to more than 200 scien-

tific papers, from which more than 140 in top ISI indexed journals, such as *Chemical Communications*, *Journal of Catalysis*, *Catalysis Science and Technology*, *Journal of Materials Chemistry*, *ACS Applied Materials and Interfaces*, *ChemSusChem*, *Langmuir*, *Applied Catalysis A: General*, *Microporous and Mesoporous Materials* etc. and more than 80 participations with oral and poster presentations at national and international scientific conferences, congresses and symposiums.

He was also assigned in the scientific committee of numerous conferences and in the editorial board of scientific journals and is as active member in numerous professional societies (*American Chemical Society*, *International Zeolite Association*, *Group Français de Zéolithes*, *International Mesostructured Material Association*, *Romanian Catalysis Society*, *Romanian Chemical Society*, *Romanian Chemical Engineering Society*, *Romanian Association of Zeolites and Molecular Sieves*, *Inventors Forum*).

His teaching area included important courses in the field of catalysis: Industrial Catalysis and Catalysts, Catalysis in Organic Industry and Petrochemistry, Catalytic Methods Applied in the Development of Clean Processes, Heterogeneous Catalytic Methods Applied in Environmental Protection, Synthesis of Catalytic Materials, Characterization of Catalytic Materials, Enzymology. He is the author or co-author of 12 books and university textbooks, most of them published having his former PhD students and collaborators as co-authors. Most of these have been very well received by the students as course supports, covering fields of interest less approached before in the scientific literature available in Romanian language. A green chemistry approach concerning the heterogeneous catalytic methods applied in environment protection, a brief and accessible book of general catalysis and another one about biocatalysis have been also highly appreciated by the scientific referents.

Professor Dumitriu had been invited as visiting professor at several distinguished universities in

Europe: Département de Sciences Université de Pau et des Pays de l'Adour, France, Laboratoire de Matériaux Minéraux ENSC, Université "Haute Alsace" de Mulhouse and Laboratoire de Matériaux Minéraux et Catalyse en Chimie Organique, Montpellier, France; Instituto di Biocatalisi e Riconoscimento Molecolare, Milano and Dipartimento di Scienze Chimiche, Università degli Studi di Cagliari, Italy. The content accuracy, clarity and remarkable graphical attractive aspect of the taught courses were largely appreciated by both Romanian students, as well as by the ones met in his visiting professor stages.

Besides the distinguished scientific eminence, Professor Dumitriu is a passionate music and visual arts lover, a person with a solid culture and an opened spirit to beauty and harmony in their many ways of occurrence.

We are delighted to warmly pay him a tribute for the valuable contribution brought to our formation and to the Catalysis research field in Romania, by dedicating him this honoring special number on his 75th anniversary. Most of the contributors for this special number are among his older or newer collaborators.

The guest editors are also grateful to the colleagues which accepted to synchronize their work with the emergence of this issue. Special thanks are due to the editing staff of *Comptes Rendus Chimie*, which accepted our initiative and made possible the manuscript collection, conducting the peer-review process and bring the results to the final form.

Doina Lutic  
Guest Editor  
Alexandru Ioan Cuza University of Iasi  
Romania  
doilub@yahoo.com

Ioana Fechete  
Guest Editor  
Université de Technologie de Troyes  
France  
i\_fechete@yahoo.com