



Dr. Maria ZAHARESCU





## ACAD. MARIA ZAHARESCU AT HER 85<sup>th</sup> ANNIVERSARY

Dr. Maria Zaharescu, member of the Roumanian Academy, celebrates her 85<sup>th</sup> anniversary. Her scientific interests covered diverse fields of materials science.

A native of Cluj-Napoca, a city in the Transylvania region of Roumania, Dr. Maria Zaharescu (*née* Demian) graduated in 1959 from the School of Chemistry of the “Babes-Bolyai” University in the same city. Her first job was in industry: she worked for Carbochim in Cluj-Napoca which produced Al<sub>2</sub>O<sub>3</sub>, SiC and grinding stones. In 1964 she took a researcher position at the Center of Inorganic Chemistry of the Roumanian Academy in Bucharest, the capital city of Roumania. This institute later merged with the Center of Physical Chemistry of the Roumanian Academy.

Dr. Maria Zaharescu received her Ph.D. degree in Inorganic Chemistry in 1971 from the Institute of Chemistry from Cluj-Napoca with a thesis on “Establishing the phase equilibria in the SiO<sub>2</sub>-TiO<sub>2</sub>-V<sub>2</sub>O<sub>5</sub> ternary system”, under the scientific leadership of Prof. Constantin Gh. Macarovici. In 1974 she received a post-doctoral fellowship in the field of phase equilibria of the oxide systems at the Laboratory of Silicate Industry of the Technical University of Denmark at Lyngby.

Very early in her career, at the age of 33, she became the Head of the Oxide Compounds and Materials Science Laboratory at the Center of Physical Chemistry, now known as “Ilie Murgulescu” Institute of Physical Chemistry of the Roumanian Academy, position which she held for 47 years.

In the beginning Dr. Maria Zaharescu focused on the physical chemistry of oxide systems, mainly thermal phase equilibria, reaction mechanisms and structure-property correlations. The results of four published papers on thermal phase equilibria were included in the “Phase Equilibria diagrams” NIST Standards Reference Database 3.1, Ed. ACerS and NIST USA.

In the ‘70s, she developed a strong interest and initiated the very first sol-gel studies in Roumania, a field that she later specialized in. More specifically, she pioneered studies in the chemistry of the sol-gel processes (the structure and morphology of the oxide materials obtained from gel phase as well as their potential applications) for:

- mono- and poly-component films and powders, with applications in optoelectronic and catalysis
- oxide and hybrid nanocomposites with silica or hybrid based matrices, in which enzymes, fullerenes, dyes, oxides were embedded and

- TiO<sub>2</sub>, SiO<sub>2</sub>, ZnO-based nanotubes, with applications as sensors and catalysts
- currently, microwave enhanced sol-gel approaches are under investigation.

The results obtained from the sol-gel studies were published in more than 200 peer reviewed papers, published in prestigious international journals. The first one was published in 1979 in *Revue Roumaine de Chimie*.

Dr. Zaharescu’s achievements in the field of sol-gel processes have been recognized internationally, as evidenced by the invitation to contribute to specific chapters in sol-gel reference books: *Handbook of Sol-Gel Science and Technology, Processing, Characterization and Applications*, 2nd edition, 2018 (Ed. Springer), *The Sol-Gel Handbook – Synthesis, Characterization and Applications*, 2015 (Ed. Wiley-VCH), book chapter in *Microwave Heating – Electromagnetic Fields Causing Thermal and Non-Thermal Effects*, 2020 (Ed. IntechOpen) or *Chemical Solution Functional Oxide Thin Films Depositions*, 2013 (Ed. Springer). As part of the Springer Briefs series, Dr. Maria Zaharescu also published “1D Oxide Nanostructures Obtained by Sol-Gel and Hydrothermal Methods” (2016).

Dr. Maria Zaharescu was either project director or in-charge with more than 80 Roumanian projects and grants and coordinated Roumanian teams in numerous international projects financially supported by the National Science Foundation (US), European Union (projects type: FP5, FP6, COST, ERA-NET), NATO

projects, bilateral intergovernmental projects with Greece, India, Slovenia and inter-academic collaborations with Bulgaria, Czech Republic, France, Hungary, Italy and Slovenia. She had invited lectures at international conferences in Europe, North and South America, Africa, Asia, Australia and New Zealand.

As an integrated part of her research she is a PhD advisor in the field of Physical Chemistry at the Graduate School of the Roumanian Academy, where she is also the Director of the Physical Science Department.

One of her main achievements is that Dr. Maria Zaharescu initiated in Roumania the first PhD studies in the sol-gel field, a new process for obtaining oxide compounds by chemical methods in solution. This helped to create in Roumania a vibrant forum of discussion in the field of sol-gel science and technology. Nowadays, she can proudly say that many of her PhD students are Professors or Senior Researchers in important Universities or Research Institutes from Roumania, but also from UK or USA.

She is a founding member of the International Sol-Gel Society and a member of the American Ceramic Society – Basic Research Division. She is also member of the editorial board of the Journal of Sol-Gel Science and Technology (Springer). She was proposed to occupy this position by the first Editor in chief of the journal Prof. Sumio Sakka.

Her activity was recognized by numerous awards, such as “Gh. Spacu” Honorary Diploma and Medal of the Roumanian Chemical Society (2007) and the “Eugen Segal” ACS Medal of Excellency (Roumanian ACS International Chemical Sciences Chapter, 2015). Most recently, in 2017 she was awarded the highest civil order of Roumania, the Order “Star of Roumania” (Knight Rank) by the Roumanian President, for exceptional services to the State and people of Roumania.

Due to her activity, she was elected in 2001 as a corresponding member of the Roumanian Academy and she was promoted to full member in 2015.

Dr. Maria Zaharescu’s scientific profile was included in recent publications such as: “Who is who in Thermal Analysis and Calorimetry”, Ed. Springer, 2014, “Successful Women in Science and Engineering Ceramics and Glass: Inspirational Profiles”, Ed. Wiley, 2016 and “Fellow of the International Sol-Gel Society (ISGS)”, 2021.

On the occasion of her 85<sup>th</sup> anniversary, the Editorial Board of *Revue Roumaine de Chimie* along with the friends, colleagues, and coworkers address Dr. Maria Zaharescu their warmest wishes of good health and many further accomplishments.

*Editorial Board*

## LIST OF PUBLICATIONS REPRESENTATIVE PAPERS (SELECTED)

1. **M. Zaharescu**, M. Anastasescu, H. Stroescu, J. M. Calderon-Moreno, N. Apostol, S. Preda, C. M. Vladut, S. Mihaiu, P. Petrik and M. Gartner, "Comparative study of the dopants (Mn vs. V) influence on the properties of sol-gel ZnO films", *J. Sol-Gel Sci. Technol.*, **2022**, *104*, 67.
2. M. Gartner, M. Anastasescu, J. M. Calderon-Moreno, M. Nicolescu, H. Stroescu, C. Hornoiu, S. Preda, L. Predoana, D. Mitrea, M. Covei, V.-A. Maraloiu, V. S. Teodorescu, C. Moldovan, P. Petrik and **M. Zaharescu**, "Multifunctional Zn-doped ITO sol-gel films deposited on different substrates: application as CO<sub>2</sub>-sensing material", *Nanomaterials*, **2022**, *12*, 3244.
3. E. Chifor, I. Bordeianu, C. Anastasescu, J. M. Calderon-Moreno, V. Bratan, D.-I. Eftemie, M. Anastasescu, S. Preda, G. Plavan, D. Pelinescu, R. Ionescu, I. Stoica, **M. Zaharescu** and I. Balint, "Bioactive coatings based on nanostructured TiO<sub>2</sub> modified with noble metal nanoparticles and lysozyme for Ti dental implants", *Nanomaterials*, **2022**, *12*, 3186.
4. S. Preda, P. Umek, **M. Zaharescu**, C. Anastasescu, S. V. Petrescu, C. Gifu, D.-I. Eftemie, R. State, F. Papa and I. Balint, "Iron-modified titanate nanorods for oxidation of aqueous ammonia using combined treatment with ozone and solar light irradiation", *Catalysts*, **2022**, *12*, 666.
5. A. Sandulescu, C. Anastasescu, F. Papa, M. Raciulete, A. Vasile, T. Spataru, M. Scarisoreanu, C. Fleaca, C. N. Mihailescu, V. S. Teodorescu, N. Spataru, **M. Zaharescu** and I. Balint, "Advancements on basic working principles of photo-driven oxidative degradation of organic substrates over pristine and noble metal-modified TiO<sub>2</sub>. Model case of phenol photo oxidation", *Catalysts*, **2021**, *11*, 487.
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7. S. Preda, C. Anastasescu, I. Balint, P. Umek, M. Sluban, C. C. Negrilă, D. G. Angelescu, V. Brătan, A. Rusu and **M. Zaharescu**, "Charge separation and ROS generation on tubular sodium titanates exposed to simulated solar light", *Appl. Surf. Sci.*, **2019**, *470*, 1053.
8. L. Predoana, I. Stanciu, M. Anastasescu, J. M. Calderon Moreno, M. Stoica, M. Gartner and **M. Zaharescu**, "Structure and properties of V-doped TiO<sub>2</sub> films obtained by sol-gel and microwave-assisted sol-gel method", *J. Sol-Gel Sci. Technol.*, **2016**, *78*, 589.
9. S. Mihaiu, I. M. Szilágyi, I. Atkinson, O. C. Mocioiu, D. Hunadyi, J. Pandelescu, A. Toader, C. Munteanu, J. Madarasz, G. Pokol and **M. Zaharescu**, "Thermal study on the synthesis of the doped ZnO to be used in TCO films", *J. Therm. Anal. Cal.*, **2016**, *124*, 71.
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13. **M. Zaharescu**, L. Predoană, A. Barău, D. Raps, F. Gammel, N. C. Rosero-Navarro, Y. Castro, A. Durán and M. Aparicio, "SiO<sub>2</sub> based hybrid inorganic-organic films doped with TiO<sub>2</sub>-CeO<sub>2</sub> nanoparticles for corrosion protection of AA2024 and Mg AZ31B alloys", *Corrosion Sci.*, **2009**, *51*, 1998.
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15. A. Barău, V. Budarin, A. Caraghirghopol, R. Luque, D. J. Macquire, A. Prella, V. S. Teodorescu and **M. Zaharescu**, "A simple and efficient route to active and dispersed Silica supported palladium nanoparticles", *Catal. Lett.*, **2008**, *124*, 204.
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### BOOK

- C. Anastasescu, S. Mihaiu, S. Preda and **M. Zaharescu**, “1D Oxide Nanostructures obtained by Sol-Gel and Hydrothermal Methods”, Springer, 2016.

### BOOK CHAPTERS

1. L. Predoană, D. A. Karajz, V. O. Odhiambo, I. Stanciu, I. M. Szilágyi, G. Pokol and **M. Zaharescu**, “Influence of the Microwaves on the Sol-Gel Syntheses and on the Properties of the Resulting Oxide Nanostructures”, in “Book Microwave Heating – Electromagnetic Fields Causing Thermal and Non-Thermal Effects”, Gennadiy I. Churyumov (Ed.), Ed. Intech Open, 2020, DOI: 10.5772/intechopen.94931
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