

FOREWORD

Dear readers and colleagues,

On August 19, 2022, the Croatian academic community mourned the loss of Professor Emeritus Tomislav Cvitaš, a cherished member of the Croatian Academy of Sciences and Arts. Professor Cvitaš was a beacon of positivity, brimming with stories and rich experiences that enlivened every scientific discussion. His insatiable curiosity about chemistry fuelled a lifelong passion for exploring complex problems with enthusiasm and rigor.

Throughout his career, he generously shared his extensive knowledge and passionately supported students, gifted pupils, chemistry teachers, and collaborators. His remarkable ability to distil intricate chemical concepts into clear, accessible explanations allowed all of us, his students, and colleagues to engage deeply with his teachings. Beyond the chemistry, his influence extended wider, enriching our understanding of life and learning. This special issue celebrates his legacy, reflecting on the profound impact he had on all who had the privilege of learning from him.

Tomislav Cvitaš was born on October 12, 1943, in Zagreb, where he completed his elementary and secondary education. Even during his high school years, he exhibited a keen interest in natural sciences. After graduating high school, he enrolled at the Faculty of Science at the University of Zagreb, earning his degree in 1966 with a thesis titled "Kinetics of the Precipitation of Lead(II) Oxalate".

Following his graduation, Tomislav Cvitaš began his career at the Ruđer Bošković Institute (RBI) as a member of the Theoretical chemistry group. However, after just four months, he pursued further studies in the United Kingdom, enrolling in a doctoral program at the University of Reading. He earned his PhD in 1970 with a thesis titled "Rotational Band Contour Analyses in Electronic Spectra of Some Substituted Benzenes", specializing in molecular spectroscopy.

In 1971, after a year of postdoctoral research at University College London, he returned to the IRB. As an external collaborator, he actively contributed to the



scientific and teaching activities in the scientific and teaching endeavors of the Department of Chemistry at the Faculty of Science, University of Zagreb. Professor Cvitaš's contributions were marked by his dedication to education and research, leaving an indelible mark on the academic community.

From 1975 to 1977, he started his research in the field of atmospheric chemistry at the Karlsruhe Institute of Technology in Germany. Upon his return to the RBI, he shifted his focus to investigations related to atmospheric chemistry, particularly measuring ozone concentrations in the ground layer of the atmosphere in Zagreb and its surroundings, as well as various locations throughout Croatia and the eastern Mediterranean region. His innovative work led to the development of simple indicators that significantly improved the understanding of photochemical air pollution caused by ozone, further establishing his reputation as a pioneering researcher in the field.

Upon returning from the UK, Tomislav Cvitaš continued his teaching at the Faculty of Science as an external professor until 1990. During this period, he

developed a wealth of teaching materials in quantum chemistry, molecular spectroscopy, and chemical kinetics, many of which remain integral to the curriculum for today's students.

In the early 1970s, recognizing the need to incorporate the International System of Units into education, he collaborated with Professor Nikola Kallay on standardizing physical quantities and units. Their joint efforts culminated in the publication of a significant booklet in 1975 titled "Physical Quantities and Units of the International System", which provided recommendations for the use of symbols and measurement units based on existing international standards. This influential document underwent several reprints and played a crucial role in shaping the writing of scientific and professional papers, as well as textbooks. Notably, the recommendations of the International Union of Pure and Applied Chemistry (IUPAC), known as the IUPAC Green Book "Quantities, Units and Symbols in Physical Chemistry", drew on the Croatian recommendations from 1975. The Green Book has seen multiple editions in 1988, 1993, and 2007, translated into eight languages. Following the release of the second edition, Tomislav Cvitaš actively participated in the work of various bodies within IUPAC, further underscoring his commitment to improving chemistry education and research on an international scale. His contributions have left a lasting legacy in both the academic community and the field of chemistry.

From 1990 to 1995, Tomislav Cvitaš spent five years at the Fraunhofer Institute for Atmospheric Sciences in Garmisch-Partenkirchen, Germany. During this time, he coordinated a significant European scientific project on environmental science, known as EUROTRAC, within the EUREKA initiative. This experience enriched his expertise in atmospheric research and fostered international collaboration.

Upon his return to Croatia in 1995, he continued his research in atmospheric chemistry at the IRB and served as a visiting professor of Physical Chemistry at the Faculty of Education at the University of Osijek. In 1997, he transitioned from IRB to the Department of Chemistry at the Faculty of Science in Zagreb, as a full professor where he remained until his retirement in 2014. During his tenure, he held several leadership positions: dean and vice-dean for teaching at the Faculty of Science, head of the

Department of Chemistry, and the first president of the Council of Natural Sciences at the University of Zagreb.

At the Division of Physical Chemistry, Professor Cvitaš taught a diverse range of subjects, including Quantum Chemistry, Molecular Spectroscopy, Chemical Kinetics, Physical Chemistry, Environmental Chemistry, and Integrated Chemistry. His teaching left a profound impact on many current scientists and educators, shaping the next generation of chemists. He also played an active role in the committee responsible for introducing new study programs within the Department of Chemistry.

Throughout his career, Professor Cvitaš remained deeply engaged in educational issues in chemistry. He published numerous articles and contributed to the field with his books, "Solving Computational Problems in Chemistry I and II," co-authored with I. Planinić and N. Kallay, which were published in 2008 and 2014. His commitment to education and research has left a lasting legacy in the academic community, inspiring countless students and colleagues.

Tomislav Cvitaš has authored 13 books and textbooks, contributed four chapters to scientific monographs, and published over 160 research papers: 30 papers in spectroscopy, 77 in atmospheric chemistry, 42 in education, and 19 in metrology. His accolades include the State Award for the Promotion and Popularization of Science in 2001, the "Andrija Mohorovičić" Award from the University of Zagreb for contributions to natural sciences in 2011, and a medal from the Department of Chemistry at Faculty of Science for enhancing scientific and educational work in 2014. In 2003, he received an IUPAC plaque for Appreciation of Service for Outstanding Contributions to the Advancement of Worldwide Chemistry, and in 2020, he became an Emeritus Fellow of IUPAC. He was designated Professor Emeritus at the Faculty of Science, University of Zagreb in 2015 and became a full member of the Croatian Academy of Sciences and Arts in the Class of Mathematical, Physical, and Chemical Sciences in 2018.

We have lost a remarkable scientist, collaborator, advisor, mentor, teacher, and professor, a man who enriched us all with his calmness, humility, kindness, and selfless sharing of knowledge.

Guest editors

Borislav Kovačević and Tajana Begović