

**Professor Dragutin M. Dražić.
On the occasion of his 70th birthday**



Professor Dragutin Dražić was born on May 5, 1930, in Belgrade. His father, Milan Dražić, was a professor at the Faculty of Civil Engineering of the University of Belgrade, while his mother, Zorka, was also a civil engineer working for the City of Belgrade. These facts, as well as the entire intellectual entourage in the “Professors’ Colony” in Belgrade, predetermined his orientation to natural sciences and engineering. Thus, after finishing elementary school before WWII and secondary school by 1949, he entered the Faculty of Science and Mathematics (Department of Chemistry) of the University of Belgrade. After his first year of study, he changed the school, enlisting in the faculty of Chemical Engineering (“Faculty of Technology”) of the same University. He graduated from the Department of Chemical Technology with the highest grade in 1956.

After graduation, he joined the teaching staff of the same school, in the Department of Physical Chemistry and Electrochemistry, in which he spent his entire career,

commencing as an assistant lecturer and becoming a full professor. His affinity for science was supported by his wife Vera (b. Kuharić) who was in the same profession and also became a university professor in physical chemistry. The family tradition continued with their two sons, Milan and Dušan, who also joined the academic world, becoming capable mathematician and computer scientists.

Profesor Dražić taught very successfully a variety of subjects, such as Electrode Kinetics, Corrosion, Electrochemical Double Layer and Adsorption (postgraduate) and finally, Physical Chemistry – a General Course. At the height of his professional career he was the Head of the Chair and Department of Physical Chemistry and Electrochemistry for several years.

In July 1959 he went to the USA, to join the Electrochemistry Laboratory of the University of Pennsylvania in Philadelphia, led by Professor John O'Mara Bockris, which at the time was the leading electrochemistry research center of the Western World. In 1970 he returned to that Laboratory by invitation of Professor Bockris, to spend another year there as a group leader in several subject areas within electrochemistry.

As a parallel occupation, he joined the Electrochemistry Department of the Institute of Chemistry, Technology and Metallurgy (ICTM) at the time of its formation in 1961, as the research base of the Faculty of Technology and Metallurgy. He was an active project- and group leader through all the years till his retirement in 2001, being the Director of that institution as it changed to the Institute of Electrochemistry ICTM.

During his entire career until the present day, Professor Dražić was actively engaged in social activities. Among numerous engagements it should be noted that he was very active in the Serbian Chemical Society performing the duties of Bursar, Secretary, Vice-President and finally President of the Society. In 1985 he was elected as a life Honorary President of the Society. At present he is the Editor of the Journal of the Serbian Chemical Society. In the succession of editors of the Journal, he was the first to succeed in achieving its international recognition by ensuring its regular monthly appearance in the English language. On the international scene, he was a National Secretary of the International Society of Electrochemistry, a Vice-President of that Society (1992–1994), a member of the Commission on Electrochemistry of IUPAC and of the Working Group on Electrochemistry of the European Federation of Chemical Engineers.

In recognition of his achievements, in 1983 he was elected a Member correspondent and in 1991 a full Member of the Serbian Academy of Sciences and Arts. In 1995 he was awarded the Medal of the Serbian Chemical Society for Exceptional Contribution to Science.

The scientific work of Professor Dražić resulted in 2 books, 3 chapters in international series of monographs, 160 papers published in scientific journals and 41 paper published in collections of works presented at different professional meetings, 28 professional studies and 7 patents. His work has been cited in the scientific literature by other authors 1460 times until the present.

The main scientific interests of Professor Dražić can be grouped into three lines of research: a) new electrochemical power sources, b) measuring methods and new

technological systems and c) electrochemical processes of deposition, dissolution and corrosion of metals.

In the first group, most of the published work is related to hydrogen–air fuel cells and metal–air systems, aluminium–air cells in particular. He was one of the initiators of research into these systems, which, according to some estimates (*Nature*, 287 (1980)), represents one of the most promising power sources of the future. Papers and patents which resulted from that work contained numerous original ideas which caught the attention of scientists working in the field throughout the World. The results which showed that aluminium can be turned from a stable construction material into a potent source of energy by low-alloying with some elements have far-reaching implications.

Professor Dražić successfully worked on new measuring techniques and technologies. Thus, he developed a new technique for measuring the adsorption of organic compounds on metal surfaces immersed in electrolytic solutions, a method for measuring the rates of corrosion of metals by recording the amounts of evolved hydrogen, a method for observing microscopically *in situ*, with magnification of up to 500, crystal growth during electrocrystallisation, *etc.* Especially important is his original method for determining the rates of corrosion from polarization measurements. He also investigated new three-dimensional electrochemical reactors with fluidized metal particles, which are specially suitable for processing dilute electrolytes, such are those encountered during elution of metal ores with very low metal contents, in waste water treatment and other similar systems.

In the third group are his investigations of the electrochemistry of iron and zinc. Aside from the papers which deal with problems of electrocrystallization of these metals, of particular importance, in view of the interpretation of corrosion phenomena, is his work on explaining the phenomena of the so-called “chemical dissolution” of metals and the mechanism of anodic dissolution.

Finally, the most important fundamental contribution of Professor Dražić is that of elucidating the mechanism of anodic dissolution of iron. He showed that the dissolution of this metals is a stepwise process involving an intermediate state of an adsorbed subferrohydroxide species in which iron is in the form of a univalent ion. This mechanism is now generally accepted and widely cited in numerous textbooks and monographies.

In conclusion, it is possible to state that Professor Dražić through his work became one of the leading figures in contemporary electrochemistry who, with his numerous followers, played a key role in forming what is known today as the Belgrade Electrochemistry School.

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