

**Professor Slobodan V. Ribnikar - On the occasion
of his 70th birthday**



This issue of the Journal of the Serbian Chemical Society is dedicated to Professor Slobodan V. Ribnikar and to his activities in the field of molecular spectroscopy, on the occasion of his 70th birthday. Among his numerous activities it is certain that Prof. Ribnikar left a noticeable impact on the local activities bound to molecular spectroscopy. A number of participants of the 12th Conference on General and Applied Spectroscopy decided that their papers be included in this issue of the Journal.

Prof. S. Ribnikar was born in Belgrade in 1929, where he attended elementary and secondary schools. He studied at the Faculty of Science, Belgrade University, in the years from 1948 to 1952, majoring in physical chemistry. His first employment was as research assistant at the Boris Kidrič Institute of Nuclear Sciences in Vinča near Belgrade. He received the doctoral degree at the Faculty of Science in 1958. During the

period 1959 to 1967 he spent four years in the Chemistry Department of the Brookhaven National Laboratory, Upton, N. Y., USA. In 1968 he was appointed as associate professor at the Faculty of Science in Belgrade. He served as director of the Department of Chemical and Physicochemical Sciences and later as vice dean of the Faculty. As full professor he retired on pension in 1994, but he still participates in many activities of the Faculty. In 1983, he was elected as a corresponding member of the Serbian Academy of Sciences and Arts and as a full member in 1994. He is an honorary member of the Serbian Chemical Society and a member of the Society of Physical Chemists of Serbia. Among others, he is a bearer of the October Prize of the city of Belgrade.

His first and lasting interest in scientific research was the chemistry of isotopes. His first research in 1952, supervised directly by Professor Pavle Savić, concerned catalysts active in hydrogen – water isotope exchange. The results were reported at the Conference on Peaceful Uses of Atomic Energy held in Geneva in 1954. It turned out that the most active catalyst in this research was identical to the one already in use in heavy water plants in the USA and Canada, but kept classified. A similar event took place at another conference in 1957 where the results of S. Ribnikar on boron isotope separation were reported simultaneously with the ones coming from the USA, England, Sweden and the USSR.

A group for stable isotope separation founded by S. Ribnikar at the Vinča Institute was for a long time one of the leading centers of its kind in Europe. It is still active today. Significant contributions to the processes of separation of isotopes of hydrogen, lithium, nitrogen, carbon and even uranium resulted from the research of this group.

While working at the Brookhaven National Laboratory, Prof. Ribnikar collaborated very fruitfully with Dr. Jacob Bigeleisen, one of the leading scientists in the field of isotope chemistry. Supplementing Dr. Bigeleisen, who was a theoretician, Prof. Ribnikar, using his experimental skills, succeeded in checking and proving a number of theoretical suppositions in isotope chemistry, *e.g.*, the inequality of the vapor pressures of the three isomeric dideuteroethylenes.

At the Faculty of Science, in the Department of Physical Chemistry, a significant part of his activity was devoted to teaching. Being an exceptional lecturer, he became one of the most esteemed and beloved professor, among the students. He taught regularly Radiochemistry and up to his retirement he held the Chair of Radiochemistry and Nuclear Chemistry. Simultaneously he introduced a new subject named the Physical Chemistry of Fluids, dealing mainly with intermolecular forces, for which he wrote a textbook. He also lectured Molecular Spectrochemistry and Atomistics at the undergraduate and Vibrational Spectroscopy at the postgraduate level. He mentored a number of doctoral and masters dissertations. A great number of diploma works was supervised by him.

Prof. Ribnikar's experience in calculating isotope effects from vibrational frequencies resulted in the introduction of infrared spectroscopy at both the Vinča Institute and the Faculty. This field has since been actively pursued by his students and

collaborators. He also introduced the use of infrared lasers for the separation of isotopes, and the use of the UV emission lines of the mercury arc to separate carbon isotopes. The separation factors for ^{13}C in the carbamate – carbon dioxide exchange system were also elaborated in detail.

Prof. Ribnikar devoted a number of years to the problem of investigating hydrogen bonds in molecular complexes of ethers and ketones with either alcohols or silanols. Models of such interactions were given and quantitative data governing the stability, which are of importance in silicon-organic chemistry, were obtained.

While investigating experimentally the discrete infrared emission of solids and liquids, Prof. Ribnikar developed a unique theory explaining the structure of these spectra.

In the field of molecular physics Prof. Ribnikar carried out detailed experimental investigations of the infrared and Raman spectra of simple molecules in order to determine whether the anharmonicity of molecular vibrations change on condensation or dissolution. Despite quite different spectra, it was concluded that the zero-order frequencies are not affected.

Even though the intention was to report on the activities of Prof. Ribnikar in the field of spectroscopy only, his activities in other fields: analyses of tritium in reactor moderators, a project of removing tritium from reactor fuels and waste waters *etc.*, must inevitably be mentioned, as must a lengthy investigation of the possible presence of element 113 in natural thallium minerals.

The results of the scientific work of Prof. Ribnikar have been published in 72 scientific papers and in a great number of conference proceedings.

Next to the purely scientific publication of Prof. Ribnikar, his contributions to other related activities must also be mentioned. For ten years (1975–1985) he was editor of the chemistry journal "Glasnik Hemijskog društva Beograd", which, in 1984, was renamed to the present title "The Journal of the Serbian Chemical Society". It is largely due to his merit that the Journal, published at that time predominantly in Serbo-Croatian, became known to the general public.

Being actively involved in editing the journal, he compiled and published the "Serbo-Croatian English Dictionary, Chemistry and Related Sciences" containing some 10000 entries, and later a list of 2000 etymologically explained chemical terms. In addition, he published 21 shorter texts on Serbocroatian professional terminology.

It is difficult to list all the activities of Prof. Ribnikar. I hope no significant items have been omitted. It is a fact that we had and still have with us an exceptional man and intellectual, a physical chemist and molecular spectroscopist, who has left significant traces in our surroundings. I recall the words of a well known French scientist who said: "Professor Ribnikar is a true intellectual, one of ones rarely encountered today. I am only an artisan. I am glad to have met him".

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