

OBITUARY

IN MEMORY OF SERGEI PROKOF'EVICH PAPKOV



On October 3, 1997, a scientist of worldwide renown, a Hero of Socialist Labor, recipient of the State Prize, Doctor of Chemical Sciences, Professor Sergei Prokof'evich Papkov passed away.

Beginning work in 1925 as a laboratory worker in the Dinamo Plant chemical laboratory (Moscow), S. P. Papkov then studied at the Soviet Army Military Chemical Academy. After graduating in 1934, he began to work as a research chemist at the Institute of Man-Made Fibres (Mytishchi) where he later became director of the laboratory.

The beginning of his scientific activity coincided with the establishment of polymer sciences and the Institute of Man-Made Fibres as a scientific-research center for investigation of polymers, polymer solutions, and fibre fabrication technologies. The work done by S. P. Papkov with V. A. Kargin and Z. A. Rogovin in 1937-1939 on the solubility of cellulose and its esters made a decisive contribution to this field. Studies which are now considered classic demonstrated the applicability of the thermodynamic phase rule to polymer solutions and thus their molecular nature. The results of these studies were not only of great theoretical but also of practical importance. They were the basis for S. P. Papkov's candidate dissertation which he defended in 1939.

From 1939 to 1963, while working at the Scientific-Research Institute of the Committee on State Security at the USSR Council of Ministers and dealing with special topics, S. P. Papkov simultaneously continued his research on polymers. He was awarded the Order of Red Banner Labor, grade 1 Order of the Great Patriotic War, three orders of the Red Star, and fourteen medals.

In 1963, S. P. Papkov returned to the All-Union Scientific-Research Institute of Man-Made Fibres (VNIIV) in the Department of Physical Chemistry, at that time directed by Prof. N. V. Mikhailov, the director of the VNIIV. Remaining true to his interest in polymer solutions, Papkov continued research in this area and in 1966 successfully defended his dissertation for the degree of doctorate in chemical sciences. Investigating conversion of polymer solutions into gels from the aspect of phase equilibrium in his dissertation, he developed original and convincing concepts on the causes of the formation and structure of polymer gels. At this time these problems were hotly debated, especially in academic circles. His ideas about gels were widely recognized. Papkov's theoretical generalization of the data on conversion of solutions of fibre-forming polymers into gels led to new developments and improvement of the technology for manufacture of different types of fibres spun from solutions. This primarily concerned hydrated cellulose fibres, which were then fundamental in the subjects treated at the VNIIV.

From 1966 to 1971, S. P. Papkov was the assistant director of scientific research at VNIIV. In this period, the research at the institute was especially successfully combined with practical applications. Third-generation fibres, thermostable and fire-resistant fibres in particular (carbon, chemisorption, hollow fibres, etc.), began to be intensively developed.

Possessing an extraordinary talent for systemizing and generalizing scientific materials, Papkov published the first monographs on "Physicochemical Principles of Processing of Polymer Solutions" and "Physicochemical Principles of Produc-

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tion of Man-Made and Synthetic Fibres" in 1971-1972. These monographs immediately became reference books for physical chemists and process engineers working on polymer solutions and fibres.

S. P. Papkov became a full professor in 1971. In 1973, after the death of Prof. N. V. Mikhailov, he became the head of the Department of Physical Chemistry at VNIIV.

The seventy years of Papkov's creative work are marked by research on the liquid-crystalline state of polymers. The studies in the physical chemistry of liquid-crystalline polymers undertaken at his initiative and assigned priority in domestic science stimulated the broad development of similar studies in many institutes in the country. The results of these studies were the physicochemical principles for the development of processes for manufacturing high-strength, high-modulus, thermostable fibres with unique properties. The fundamental theory of solutions and the liquid-crystalline state of polymers developed by S. P. Papkov led to the relatively rapid solution of such large applied problems as starting production of new types of fibres primarily required as reinforcing materials in the creation of aircraft, modern parachute systems, and other technical articles with special applications. For his great services in the development of the chemical industry and many years of scientific activity, S. P. Papkov was named a Hero of Socialist Labor and was presented the Order of Lenin in 1983.

The first theoretical results of studying the liquid-crystalline state of polymers were generalized by S. P. Papkov (together with V. G. Kulichikhin) in the monograph "The Liquid-Crystalline State of Polymers" (1977). S. P. Papkov and his coauthors were awarded the USSR State Prize for 1985 for the cycle of work on the "Physical Chemistry of Synthetic Liquid-Crystalline Polymers" performed at Khimvolokno Scientific and Industrial Association, Moscow State University, and the Institute of Macromolecular Compounds.

At the end of the 1980s, S. P. Papkov focused his attention on studies to create cellulose fibres from so-called direct, ecologically clean solvents. Because of these studies, the All-Union Scientific-Research Institute of Polymer Fibres now has original solutions whose priority is secured by patents on fabrication of cellulose fibres from highly concentrated solutions of cellulose in N-methylmorpholine N-oxide.

The multifaceted character of S. P. Papkov's scientific interests was also clearly seen in the monographs "The Gel State of Polymers" (1974), "Reaction of Cellulose and Cellulose Materials with Water" (together with É. Z. Fainberg, 1976), "Phase Equilibrium in Polymer-Solvent Systems" (1981), "Physicochemical Principles of Plasticization of Polymers" (with P. V. Kozlov, 1982), "Polymer Fibre Materials" (1986), and "Theoretical Principles of Fabrication of Chemical Fibres" (1990). More than one generation of young scientists were taught with these monographs, and they were used by experimental researchers working on the physical chemistry of polymers and technologies for fabrication of chemical fibres, films, and polymer coatings.

S. P. Papkov also published more than 300 scientific articles and reports in domestic and foreign journals. More than 20 candidate and 5 doctoral dissertations were defended under his direction. He headed the expert scientific school in the field of polymers and fibres. The works of S. P. Papkov and his students and colleagues were widely recognized and respected in scientific circles in our country and abroad.

For many years, S. P. Papkov was active in specialized scientific committees on defense of dissertations at the All-Union Scientific-Research Institute of Polymer Fibres and the L. Ya. Karpov Scientific-Research Institute of Physical Chemistry, as well as the expert committee of the Higher Commission on Certification. To his final days, he tirelessly worked on the editorial boards of the journals *Vysokomolekulyarnye Soedineniya* and *Khimicheskie Volokna*.

These landmarks of S. P. Papkov's creative life and activity are only strokes in the portrait of an outstanding scientist whose true, deeply devoted service to science was fundamental in all situations. To the end of his life, he deeply loved science. He rejoiced in interesting results, scientific progress as a whole, and was vexed by mishaps.

The best traits of a great, phenomenally erudite scientist and the pleasing qualities of a highly moral human being were harmoniously combined in Sergei Prokof'evich. His extremely friendly, respectful attitude toward his colleagues, skill in listening attentively to and understanding everyone who came to him drew very different people to him. The luminous memory of Sergei Prokof'evich as a scientist and person of great character is preserved in the hearts of his students, colleagues, friends, and everyone who had the good fortune to know him and experience his charm and high culture.