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63. Ivan Panayotov

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Personalities in Polymer Science



Ivan M. Panayotov

Honoring Professor Ivan M. Panayotov on his 70th birthday

Ivan M. Panayotov is one of the outstanding scientists in the field of ionic polymerization and one of the leading personalities of polymer science in eastern Europe. He is also one of the founders of polymer science in Bulgaria.

Professor Panayotov was born on January 20, 1925, in the Bulgarian capital, Sofia, as the son of Martin and Maria Panayotov. He graduated from the prestigious first high school of Sofia. His interest in chemistry dates from his early school days. He entered Polytechnic Institute of Sofia, and, in 1949, he obtained his University degree with honors in Industrial Chemistry.

After his graduation from the Department of Organic Chemistry at the Polytechnic of Sofia, he worked on his Ph.D. dissertation on **Bioactive Compounds** from 1951–1954. He then worked at the Chemical Institute, on the synthesis of organic lithium compounds with the famous Bulgarian organic chemistry Professor D. Ivanov.

Panayotov also studied the composition of some natural products, mainly the components of rose oil. Bulgarian rose oil, worldwide known for its exquisite fragrance, is produced from the plant *Rosa Damascena var. Kazanlik*, which has been cultivated in the famous

Rose Valley, situated between the Balkan and Sredna Gora mountains, for more than 300 years. The harvest of the rose blossoms takes place in the early mornings during the period from May 15–June 15. The properties of the Bulgarian rose oil are based on specific methods of cultivation of the roses, harvesting and distillation of the extracts. The aroma components are present in very small amounts. Up to now, at least 127 chemical compounds has been identified as ingredients in rose oil, including alcohols, aldehydes, esters, ethers and hydrocarbons. Panayotov isolated and identified several new and unknown components: 2 esters, 2 ketones and 6 aldehydes which are primarily responsible for the aroma (bouquet) of the rose oil.

However, Panayotov's main interest soon became **polymer chemistry**. His first publications appeared in 1957 based on the kinetics and the mechanism of radical polymerization.

Ivan Panayotov founded the Bulgarian school of ionic polymerization. His first work in the field (1967) was concerned with the initiation of cationic polymerization with molecular sieves. His interest in cationic polymerization was sparked by his studies on the effect of electron acceptors on the progress of cationic polymerization and the initiation of cationic polymerization.

In his work on anionic polymerization, the initiation ability of anion radicals and dianions was investigated as was the initiation with anionic metal adducts of nitriles and ketones. The polymerization and copolymerization caused by alkali metals intercalates in graphite as initiators for anionic polymerization was also investigated. Panayotov also prepared very high molecular weight polymers from lactones. The use of acceptors as effective additives in cationic polymerization and the studies on the complex forming ability of poly(ethylene oxide) was also studied. Investigations starting in the early 70's established the strong solvating properties of poly(ethylene oxide) and some other polymeric ethers.

Panayotov's activities extended from very theoretical and fundamental research into practical problems as well. Together with his team he developed for Bulgaria an original technology for the industrial production of high molecular weight

poly(ethylene oxide) which at that time was produced only in the USA and in Japan.

Ivan Panayotov was appointed Associate Professor in 1959 and Professor of Polymer Chemistry in 1969. He was granted the degree of Doctor of Chemical Sciences (the advanced degree that was customarily given in Eastern European countries as a recognition of advanced scientific achievements) in 1975. In 1963 he organized the teaching program in the chemistry and physics of polymers at Sofia University "St. Kliment Ohridsky" and taught there for many years.

Ivan Panayotov also organized the laboratory of **Macromolecular Chemistry** of the Bulgarian Academy of Sciences which later became the Institute of Organic Chemistry. He subsequently created and became the head of the laboratory **Polymerization Processes** which was then incorporated in the Central Laboratory of Polymers of the Bulgarian Academy of Sciences. This laboratory became the focus of polymer science in Eastern Europe. Many scientists from East-European and some West European countries were trained and worked in the Institute.

Ivan Panayotov has published about 170 papers and holds 50 patents. He also wrote a textbook of "Chemistry and Physics of Polymers" and several book chapters.

Ivan Panayotov was a frequent lecturer at symposia on polymers, at the Gordon Conference and he also was a Visiting Professor and Lecturer at Universities in 10 countries. In 1993 he organized and was the Chairman of the 11th International Symposium on Cationic Polymerization and Related Processes in Borovets, Bulgaria which was attended by scientists from 22 countries.

For many years, Panayotov was the national representative of Bulgaria in the Macromolecular Division of the IUPAC. He received two most prestigious awards for achievements in Science in Bulgaria—those of "St. Cyril" and "St. Methodius".

Ivan was married to Lydia, a biochemical engineer who died in 1994. He has a daughter, Mariana, a biochemist and a son Martin, who has a business in Sofia. Ivan also has 2 grandchildren, one from each of his children.

When Ivan Panayotov was young, he was an enthusiastic mountain climber and chess player. Now his hobbies include the

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enjoyment of classical music, art, painting and architecture. In collegial circles he organized popular lectures on the History of European architecture.

Ivan Panayotov is also an accomplished linguist and speaks in addition to Bulgarian, English, German, French and Russian. With his additional knowledge of Latin and Ancient Greek, Ivan Panayotov was primarily responsible for the creation of the Bulgarian terminology of polymer science.

This article has been prepared by Christo Tsvetanov, Polymer Institute, Bulgarian Academy of Sciences, Sofia, Bulgaria and Otto Vogl, Herman F. Mark Professor of Polymer Science, Polytechnic University, Brooklyn, NY.