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## In Memoriam

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## In Memoriam

**Dragutin Fleš** (1921–2005)



Professor Dragutin Fles, the distinguished Croatian chemist, internationally recognized scientist, member of the Croatian Academy of Sciences and Arts, died on June 11, 2005. He was born on August 1st, 1921 in Vukovar (Croatia), studied chemistry at the Technical Faculty, University of Zagreb, where he obtained engineering degree in 1946. During the period from 1946 to 1960 he was employed at Pliva, Pharmaceutical and Chemical Company in Zagreb, Department of Chemotherapeutical Drugs Production. In 1950 he worked as a member of "Foreign Student Summer Project" at Massachusetts Institute of Technology, Cambridge, Mass, on the synthesis of  $\beta$ -carotene in the laboratory of Professor Nicolas A. Milas. Two years later (1952) he obtained his D. Sc. degree from the University of Zagreb with the thesis "Synthesis of optically active sulfur containing  $\beta$ -amino acids of the known absolute configuration", under the supervision of Professor Krešimir Balenović (1914–2003). During the academic year 1952/53 he continued the work on the synthesis of polyenes at MIT, Cambridge, in the laboratory of Professor N. A. Milas. The academic year 1957/58 he spent as fellow of the Alfred P. Sloan Foundation at Urbana, Ill., working with Professor Roger Adams on the configuration of C1 and C8 atoms of pyrrolizidine moieties of Senecio alkaloids.

Soon after he returned from the University of Illinois, Urbana, he became engaged in the organization of development of petrochemical industry in Zagreb. As a newly appointed Research Director of Organic Chemical Industry (OKI) he organized the first modern equipped research institute actively engaged in the development of new polymeric material and petrochemicals of commercial interest.

In 1975 he was elected full Professor (h. c.) of stereochemistry at the Faculty of Natural Sciences and Mathematics, University of Zagreb.

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In 1967 Dr. Fleš was one of the founders of INA-Institute where he worked as head of the Laboratory Research. In 1983 he was appointed member of the managing board at INA-Research and Development Organization. After his retirement in 1985 and until recently, Dr. Fleš successfully participated in INA-research program.

Professor Fleš was elected associate member of the Yugoslav (now Croatian) Academy of Sciences and Arts in 1981 and its regular member in 1992.

He was honored with many awards including the two most important in Croatia, Ruder Bošković Award in 1982 and Life Achievement Award in 1988.

The research work of professor Fleš covers a wide field of macromolecular and organic chemistry, stereochemistry of natural products, synthesis of polyenes, and preparation and characterization of a large number of optically active polymers like polyamides, poly- $\beta$ -propyolactones, poly- $\beta$ -propyothiolactones, substituted polybutadienes, poly(phenylvinyl alkyl ethers) and alternating copolymers prepared through the participation of CT-complexes. He also actively worked on synthesis and characterization of liquid crystalline polymers containing mezogenic groups in side chains. In collaboration with the Amherst Univ-Mass, Professor Fleš was involved in studies of the miscibility-immiscibility behavior in polymer-polymer blends, and prediction of properties of alloys by the application of mean field theory. It is of importance to emphasize his active participation in the synthesis of crosslinked polymers and copolymers which contain selectively imprinted regions.

As visiting professor he presented lectures at the University of Merseburg, in the Max Planck Institute in Mainz, University of Massachusetts, Ann Arbor, Michigan, University of Arizona, and as lecturer he participated in Summer Schools on Optically Active Polymers at Forge-les-Eaux in France. During the summer periods of 1980 and 1990 he participated as lecturer in Summer Schools on Polymers, NATO Institute of Science, Tirrenia, Italy. With his coworkers he presented a large number of plenary lectures and reports on various IUPAC Symposia: Madrid, Budapest, Amherst, Mainz, Helsinki, Strasbourg, Paris, Louvain, Brussels, and in 1977 he presented an introductory lecture concerning the mechanism of alternating copolymerization at the Gordon Conference in New London, NH. He also participated as lecturer at international conferences on development of petrochemistry.

Research of Professor Fleš has been published in more than 200 scientific papers, mostly in leading international journals, 70 professional and review articles, 31 patents and over a 100 scientific and review articles published in proceedings of international and domestic conferences and symposia.

Polymer Bulletin, Volume 5, number 9/10, 1981, published his biography on the occasion of his 60th birthday with series of papers of his coworkers and colleagues from different institutions. Ten years later, the same Journal also dedicated one issue to Professor Fleš. In honor of his 75th and 80th anniversary, well known Croatian journal Polimeri published special issues to Dr. Fleš. In 1984, Polymer News published his biography in the column titled Polymer Science Pioneers.

At the end of this rather brief account of the life and work of Professor Fleš, I wish to add that one of the most significant features of his activity was the ability to incorporate fundamental research into industrial application. Among his personal characteristics, the dominant ones were inventiveness and enthusiasm, which he conveyed to his collaborators, devotion to research and application of the results of his investigations, as well as his ability to coordinate the work of large research groups.