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#### Liquid chromatography of block copolymers

Block copolymers represent an important group of materials with extensive applications in science, medicine and technology. In a block copolymer, at least two chemically distinct polymer chains are connected with a chemical bond. Comprehensive molecular characterization of block copolymers represents an analytical challenge. A special problem is determination of amount and molar mass of parent homopolymers, which are present in most block copolymers, and which constitute highly undesired, expensive ballast. Gel permeation chromatography, (size exclusion chromatography) GPC/SEC is commonly employed for characterization of block copolymers. Molar mass of a precursor, the block polymerized as first, is determined by GPC/SEC and the same method is employed for the approximate assessment of total molar mass of block copolymers. Due to low separation selectivity and detector sensitivity GPC/SEC can hardly identify presences and render molar mass information on parent homopolymers. We will discuss principles and applications of the original alternative liquid chromatography methods namely liquid chromatography under limiting conditions of enthalpic interactions, LC-LC and sequential two-dimensional polymer liquid chromatography, S2D-LC. LC-LC methods are well robust and experimentally feasible. Their separation selectivity is very high and sample recovery is reasonable. LC-LC can in one single step easily and efficiently discriminate both parent homopolymers from diblock copolymers. The separated sample constituents can be one-by-one forwarded into an on-line GPC/SEC column for determination of their molar mass average and distribution. Parent homopolymers present in the block copolymer at very low concentrations below 1% of can be traced and characterized, by this novel approach.

#### Biography

Dusan Berek is currently employed at Polymer Institute, Slovak Academy of Sciences in Bratislava. He has served as Elected Member of the Presidium of the Slovak Academy of Sciences, President of the Slovak Chemical Society and Chairman of the Czecho-Slovak and Slovak National Committee of Chemistry for IUPAC. He is Corresponding Member of the Central European Academy of Sciences and Member of the Learned Society of the Slovak Academy of Sciences. He is the author or co-author of two monographs and 250+ scientific papers published in refereed periodicals, proceedings and chapters of books, as well as 60+ patents (four of them were licensed) and was cited more than 2,000 times. He has presented over 110 invited plenary, key and main lectures as well as over 900 regular lectures and poster contributions on symposia and conferences and during lecturing tours to over 40 countries. He was elected as "Slovak Scientist of the Year 1999" and "Slovak Innovator of the Year 2001".

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