



## SUBJECT DATASHEET

<b>Semester:</b>	2009/10/1
<b>Subject:</b>	Separation methods in analytical chemistry
<b>Code:</b>	VEMKAV4112E
<b>Responsible department:</b>	Department of Analytical Chemistry
<b>Responsible department code:</b>	MKKA
<b>Responsible lecturer:</b>	dr. Péter Hajós

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### Educational objectives:

An understanding of the principles of modern separation methods of analysis

### Detailed content of the subject:

1. Classification of Analytical Separation Methods. Basic Concepts and Relationships. Thermodynamics of Chromatographic Retention. 2. Plate Theory and Efficiency in Chromatography. Control of Separation. 3. Liquid Column Chromatography (adsorption, partition, ion-exchange, normal- and reversed phase systems). 4. Ion-, Ion Pair- and Ion Exclusion Chromatography. 5. Ligand-Exchange, Extraction and Perfusion Methods. Chiral Separations. 6. Gel Chromatography, Affinity Chromatography. 7. Thin-Layer Chromatography. Supercritical Fluid Chromatography. 8. Gas Chromatography (gas/liquid, gas/solid). 9. Hyphenated Methods in Gas- and Liquid Chromatography. 10. Electro-Chromatography (zone electrophoresis, isoelectric focusing, capillary electrophoresis, micellar electrokinetic capillary chromatography). 11. Preconcentration of Samples. Matrix-elimination. Sample Handling. 12. Preparative Separations. 13. Prediction of Retention Behaviour. Optimization. Selecting and Developing of the Methods. Column and Mobile Phase Selection. Strategy for Separations. 14. Instrumentation (mobile-phase delivery system, analytical columns, detection, injection, valves) 15. Applications (biochemical, pharmaceuticals, clinical, industrial, environmental). International Literature of Chromatography.

### Requirements:

The topics of the lectures

### Required and suggested references:

D. A. Skoog, J. J. Leary: Principles of Instrumental Analysis, Saunders College Publishing, 1992. L. R. Snyder, J. J. Kirkland: Introduction to Modern Liquid Chromatography, J. Wiley Publ. 1974. P. Haddad, P. Jackson: Ion Chromatography, Elsevier Publ. 1992. R. Scott: Liquid-chromatography Detectors, Elsevier Publ. 1986. E. Kováts: Chromatographic Methods, Lausanne, EPFL, Lecture Notes, 1994.