

GPC-SEC Theory and Praxis (P/N 899-0022)

Description

This training course provides theory lectures and practical sessions for modern analysis of macromolecules using gel permeation chromatography (GPC), also known as size exclusion chromatography (SEC). It covers the theoretical background of the separation technique, gives practical advice for reproducible and accurate analysis, and shows the application advantages as well as the limitations of GPC/SEC and GPC/SEC hyphenation with light scattering, viscometry and other techniques. In the praxis sessions small workgroups (maximum 5 people) verify a GPC/SEC system, check the performance of the separation column, calibrate, and evaluate samples using different techniques. Each group has its own tutor, an experienced polymer chemist, to discuss also special applications and questions.

After successful participation each attendee should be able to obtain results from analysis data, to qualify the condition of the analytical system and the separation columns, and to optimize the application conditions and the work flow in the lab.

Program

Monday

09.30 Welcome and General Information

09.45 Introduction and GPC/SEC Basics

Theoretical background polymer synthesis and liquid chromatography
Comparison and differentiation GPC/SEC - HPLC
Analysis aims GPC/SEC
GPC/SEC Separation mechanism
Retention, plate count, resolution, efficiency
Molar mass determination and Molar mass distributions: averages, moments, meaning

11.00 Coffee break

11.15 Experimental Setup and Parameters (1)

Sample preparation and solvent selection
Column selection and method optimization
Influence of analytical conditions

12.15 Coffee break

12.30 Experimental Setup and Parameters (2)

GPC/SEC detectors
Increasing accuracy and reproducibility

13.15 Lunch

14.15 Practical Session part I

Setup and qualification of a GPC/SEC system
System check and column selection
Influence experimental conditions
Determination plate count, efficiency and resolution

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approx. 15.30 Coffee break

17.00 End of Practical Session part I

17.00 Snack

18.00 Visit C.A. Kupferberg & Cie., Mainz, Production and tasting sparkling wine (optional)

20.30 Dinner

Tuesday

09.00 **GPC/SEC Calibration methods (1)**
Calibration with molar mass standards
Universal Calibration
Broad Calibration
Integral Calibration

10.00 Coffee break

10.15 **GPC/SEC Calibration methods (2)**
Copolymer calibration options
Molar mass determination with viscometer and/or light scattering detection

11.15 Coffee break

11.30 **Chromatographic Couplings for the Analysis of Complex Polymer Systems**
Copolymer analysis with dual detection
Characterization using on-line viscosity detection
Identification with GPC-FTIR coupling
Identification with GPC-FTIR coupling, UV-spectra and/or mass spectrometry
2-dimensional chromatography: Hyphenation of HPLC with GPC/SEC

13.00 Lunch

14.00 **Practical Session part II**
Calibration of the GPC/SEC system
Comparison calibration options
Analysis unknown samples
Optimization Evaluation
Trouble shooting

approx. 15.30 Coffee break

approx. 18.00 End of Practical Session and Course

Venue

Novotel Hotel Mainz, Augustusstraße 6, 55131 Mainz

Mainz is approx. 35 km away from Frankfurt Airport and can be reached easily using the public transport system. Please contact us directly for further assistance.