

## ***Light scattering and viscometry hands-on training: successful work with molar mass sensitive detectors***

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### **Description**

This seminar covers all aspects for working with advanced detection methods and instruments for the determination of molar masses, sizes, and structures of macromolecules and biopolymers in solution. Lectures providing the theoretical background on (multi angle) light scattering and viscometry will be followed by hands-on training sessions on practical aspects and data processing. Tutored discussions in small workgroups and a trouble shooting session ensure that all aspects of molar mass sensitive detection are trained efficiently. Each group has its own tutor, an experienced polymer chemist, to discuss also special applications and questions.

### **Who should attend?**

- All scientists working with techniques to determine the molar mass and the size of polymers in solution.
- Scientists interested in adding molar mass sensitive detection to their equipment.
- Users of light scattering and viscometry detectors (triple detectors) independent on the brand.

### **How you will benefit!**

Attendees

- will be able to select the best and most precise method for an application task
- acquire the theoretical background to perform accurate and precise measurements and analysis
- will understand how to set up, optimize and troubleshoot instruments
- have the skills to recognize good data and result quality

## **Program**

### **Day 1**

**09.00 Welcome and General Information**

**09.15 Introduction to advanced polymer analysis**

- understanding molar mass averages and molar mass distributions
- multiple distributions in macromolecules
- methods for polymer characterization
- GPC/SEC fundamentals and detector characteristics
- light scattering and viscometry applications

**10.45 Coffee break**

**11.00 Molar mass and size determination**

- theoretical background for light scattering and viscometry data analysis
- off-line light scattering and viscometry detection
- off-line  $dn/dc$  determination
- advantages of on-line light scattering and viscometry detection
- coupling GPC/SEC equipment with advanced detection

**13.00 Lunch**

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- 14.00 Practical Session, Part 1**
- off-line light scattering and data analysis with Zimm plots, analysis of 2 samples
  - setup of a GPC/SEC instrument with advanced detection, sample preparation for universal calibration and instrument setup and qualification (samples should be measured over night and processed the next day)
  - off-line dn/dc determination

with Coffee break

**18.00 End of Practical Session, Part 1**

**18.30 Guided city tour (optional)**

**20.00 Dinner**

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**Day 2**

- 09.00 Qualified analysis of light scattering and viscometry data, Part 1**
- determination of the required parameters
  - methods for the determination of slice concentration
  - WinGPC evaluation options and result presentation for light scattering and viscometry

**10.15 Coffee break**

- 10.30 Qualified analysis of light scattering and viscometry data, Part 2**
- precision of results and error propagation
  - data consistency check and trouble shooting

**11.30 PSS WinGPC UniChrom - Detector setup and universal calibration**

**12.00 Lunch**

- 13.00 Practical Session, Part 2**
- determination of the parameters for a proper instrument setup
  - evaluation of the unknown samples
  - discussion of the results and comparison of the methods

with Coffee break

- 17.00 Summary, Questions and answers**
- Quiz with questions dealing with the seminar topics
  - Round table discussion for applications and additional results

**17.15 End of Course and Farewell**