



Vendor Exhibition Abstracts

Vendor Exhibition Schedule

Monday Lunch **ACQUITY Advanced Polymer Chromatography (APC), The Next Generation of SEC/GPC Analysis**
Waters Corporation

Combined Analytical Techniques For Polymer QC
Malvern Instruments Inc.

**Expanding Your Polymer Characterization SEC Knowledge:
Column Selection and Coupling of Detection Methods**
Tosoh Bioscience, LLC.

Tuesday Lunch **PSS Solutions For Macromolecular Characterization**
Polymer Standards Services (PSS)

**A Novel, Direct Coupling Of Simultaneous DSC/DTA-TGA (STA)
And FTIR Called Perseus™**
NETZSCH Instruments North America, LLC.

Small Angle X-ray Scattering (SAXS)
Xenocs SA

PSS Solutions For Macromolecular Characterization

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Abstract

PSS is a global leader and innovator in the design and production of particles and packing materials for high performance GPC/SEC columns. We provide the widest range of highly characterized macromolecular standards for calibrating GPC systems. We synthesize a wide range of tailor made polymers. Our **WinGPC** software is the most comprehensive suite of programs for macromolecular characterization and analysis and includes instrument control for all major providers of GPC instrumentation. We have a modern and sophisticated range of SEC and SEC related instrumentation for macromolecular (synthetic and bio macromolecules) analysis, identification, characterization and deformation regardless of the architecture, topology or composition of a macromolecule.

PSS has developed analytical methods, interface technology and instrument and analysis software for using hyphenated techniques such as;

- GPC-Multi-angle Light Scattering (MALS) - (molar mass and topology)
- GPC-Viscometry - (molar mass and topology)
- GPC-MS - (identification, end group analysis)
- 2D Chromatography (LAC-SEC or LCCC-SEC) for deformation by chemistry and size
- 3D Chromatography (LAC-SEC-FT-IR) for deformation by chemistry, size and identification
- GPC-IR/NMR (identification)

These techniques can be used not only to identify polymers but can support further kinetic or mechanistic studies of polymerization processes

ACQUITY Advanced Polymer Chromatography (APC), The Next Generation of SEC/GPC Analysis

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Abstract

Size exclusion chromatography (SEC/GPC) is used for the characterization of polymeric material, specifically their molecular weight distribution. Resolution of polymeric species requires long column lengths and banked column configurations, resulting in lengthy analytical test cycle times and associated consumption of costly and often hazardous solvents. Additionally, many test sets suffer from minimal replicate data points due to long analysis time resulting data with limited statistical weighting.

Taking advantage of the advances in chromatographic separations instrumentation and innovative robust column technology, the Waters ACQUITY APC System allows for improved resolution of polymer distributions with significantly shorter chromatographic run times and associated reduction in total analysis cycle time. Built on a holistic approach for instrument and column design, an unprecedented control of separation conditions required for polymer size based separation is achieved. The resulting ACQUITY APC system enables precise data generation for polymer characterization. Additionally, richer data sets with replicate analysis are easily obtained within minutes and not hours.

Combined Analytical Techniques For Polymer QC

Malvern Instruments Inc.
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Abstract

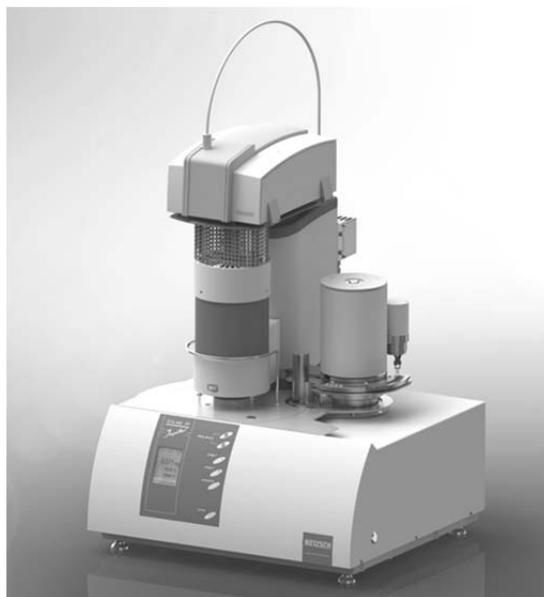
The use of multiple optimized analytical technologies including Triple Detection GPC, Flow Injection Polymer Analysis, Automated Dilute Solution Viscosity and Rheological measurements can be combined to optimize the work flow in current Polymer Quality Control Laboratories. The fundamental principles of these measurements will be reviewed to give analysts a greater appreciation of how these techniques work together to potentially reduce laboratory work load while improving overall Quality Control.

A Novel, Direct Coupling Of Simultaneous DSC/DTA-TGA (STA) And FTIR Called *Perseus*[™]

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Abstract

The interpretation of thermogravimetric analysis (TGA) signal alone can be difficult. A solution to this problem is evolved gas analysis which involves coupling the thermal analyzer to a spectrophotometer. Up until now this coupling has been done using adapters and heated transfer lines. In the new *Perseus*[™] STA 449 F1/F3 (DSC/DTA-TGA-FTIR), the short, heated coupling interface without any transfer line minimizes the risk of condensation, makes the system robust and reveals an excellent correlation of TGA and FTIR. This is made possible through the unmatched alliance between two successful instruments: the NETZSCH STA 449 F1/F3 Jupiter® and the ALPHA® FTIR spectrometer by Bruker Optics. The direct *Perseus*[™] coupling is superior for highly condensable materials. Additionally, there is no need for liquid nitrogen cooling of the IR-detector, which makes it particularly well-suited for test runs with an autosampler (robot) or for measurements of longer duration. The compact, space-saving design is yet another useful feature for labs in which space is limited. In addition, the STA can be used as standalone unit, strengthening the versatility of the system. This unique, compact combination of two powerful instruments creates a single device capable of characterizing the thermal behavior of organics/polymers/biomass and also inorganics/ceramics/minerals, more clearly elucidating the chemistry behind the processes under investigation.



Perseus[™] STA 449 F1/F3 – Simultaneous
DSC/DTA-TGA- FTIR System

Expanding Your Polymer Characterization SEC Knowledge: Column Selection and Coupling of Detection Methods

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Abstract

The backbone of polymer characterization via size exclusion chromatography is the column selected to perform the separation; without the correct column the information obtained from various detection methods, e.g. refractive index, light scattering, etc., becomes obsolete. The selection of a suitable SEC column for polymer analysis can easily become a daunting task as hundreds to thousands of different columns are currently available. However, selecting the correct column is required as the molar mass averages typically obtained from SEC experiments rely heavily on the quality of separation being performed. Here, we will discuss the different criteria involved in selecting the best TSKgel® column for polymer analysis. The importance of selecting a column that is suitable for the polymer undergoing analysis will be shown through applications of natural and synthetic polymers via single- and multi-detector SEC using TSKgel columns and the EcoSEC® GPC System. Lastly, we will provide an overview of the physiochemical properties obtained from single- and multi-detector SEC when the correct column is chosen.

Small Angle X-ray Scattering (SAXS)

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Abstract:

Xenocs, distributed in the US by Mosaic Distribution LLC, provides advanced solutions for nanomaterials studies such as the Xeuss system, a high performance modular SAXS/WAXS equipment. Xeuss integrates state of the art detectors and our high brilliance GeniX 3D source, coupled to our latest generation of scatterless collimation for maximized useful flux on the sample and ultimate set-up resolution.

Small Angle X-ray Scattering (SAXS) is proving to be a powerful technique for getting information related to the structure of nano-materials. The method requires little sample preparation, is non-destructive and in contrast to microscopy probes a volume of the sample thus giving a statistically meaningful result. When combined with Wide Angle X-ray Scattering (WAXS) one can also get information on crystalline structure.

Please join our lunchtime presentation to get a review of the considerable progress made in laboratory SAXS/WAXS instrumentation. Rapid measurements and high data quality opens the way towards dynamic measurements with parameters like temperature, humidity, flow, DSC, shear as well as high precision structure resolutions. We will present various results illustrating capabilities of our high performance Xeuss equipment for polymer structural characterization.