Best of Both Worlds: Combining Advanced Polymer Chromatography with Advanced Multi-Detection for Complete High-Resolution Polymer Characterization

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Waters™ ACQUITY™ Advanced Polymer Chromatography™ (APC™) is a breakthrough technology that provides SEC analyses of polymeric materials with higher-resolution and higher-speed than conventional SEC. The APC system generates extremely precise, reproducible molecular weight information. To obtain comprehensive knowledge of the polymer samples under analysis, the experiment can be improved through a combination of the high-resolution APC system with additional advanced detectors.

The combination of the Waters APC system with the Malvern® Panalytical® OMNISEC® REVEAL, containing refractive index (RI), UV-Vis photodiode array (UV), light scattering (LS), and differential viscometry detectors, greatly broadens the information attainable from a SEC analysis without sacrificing resolution. The OMNISEC REVEAL is an advanced multi-detector system that offers absolute molecular weight, molecular weight distribution, size, structural (Mark-Houwink parameters), and compositional measurements.
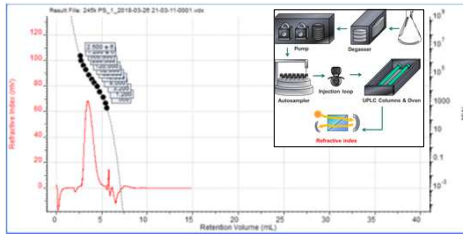

ENHANCED RESOLUTION

Waters ACQUITY APC (Advanced Polymer Chromatography)

Speed
Efficiency
Resolution

UPLC™-SEC (Conventional)

Advantages of the Waters ACQUITY APC

- Highly reproducible data
- Flexible detection techniques
- Low system dispersion
- Compatibility with challenging solvents
- Precise solvent management
- Stable RI detection
- Rigid, solvent-resilient columns
- Versatile column management

Limitations of Conventional Calibration

Molecular weight values obtained are very precise, but accuracy is **relative** to the standards used

Calibration curve depends on multiple factors (columns, mobile phase, flow rate, temperature)
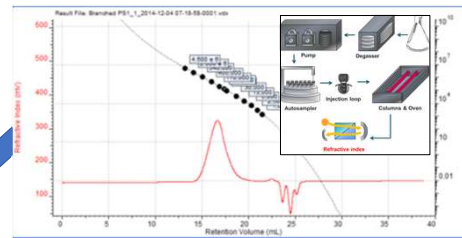
Every polymer type has its own calibration line based on unique molecular shape

Accuracy of data depends on how similar the molecular structure of the sample is to the standards

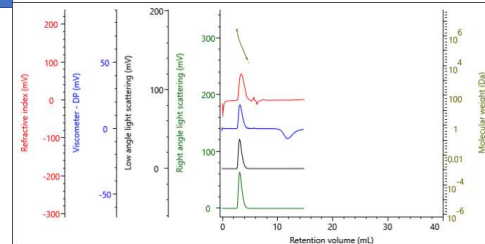Data is limited to molecular weight and molecular weight distribution

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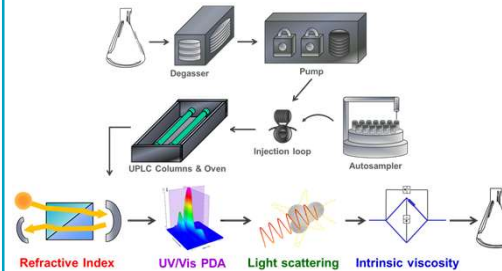## THE HISTORICAL APPROACH

Analytical SEC (Conventional)

BEST OF BOTH WORLDS

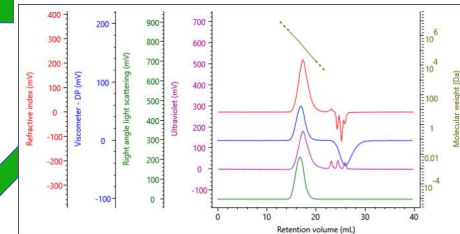### Multi-Detector UPLC-SEC

APC – REVEAL Combined Setup

ADVANCED CHARACTERIZATION

Malvern Panalytical OMNISEC REVEAL

More Information

Multi-Detector Analytical SEC

Advantages of the OMNISEC REVEAL

- Absolute molecular weight without the need for column calibration
- Sample concentration
- % recovery
- Size: hydrodynamic radius across the samples entire molecular weight range
- Structure: Mark-Houwink parameters and branching
- Composition with both RI and UV detectors
- Reduced brand-broadening with a unique flow path where the RI detector comes first

The Multi-Detection Pyramid

Waters™ | TA Instruments

Malvern Panalytical
a spectris company