**New GFC Columns for Low Baseline Noise MALS Analysis**

Toru Matsu, Melissa Turcotte, Ronald Benson

1. Showa Denko America, Inc., 420 Lexington Avenue, Suite 2335A, New York, NY 10170, USA
2. Showa Denko K.K., 5-1 Ohkimachi Kawasaki-ku, Kawasaki, 210-0867, Japan

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**Abstract**

Multi-angle light scattering (MALSS) detection has become an indispensable tool for polymer characterization. The coupling of MALSS with high-performance size exclusion chromatography has provided a unique and attractive technique for obtaining absolute molecular weight information and molecular size information about macromolecular systems including both natural and synthetic materials.

Currently, Showex has SB-800 HQ series for the analysis of water-soluble molecules and for the determination of molecular weight distribution. Further improvement of the column has been desired for the advanced analysis coupled with MALSS for superior base-line noise performance.

Showex has successfully developed the LB-800 columns which are suitable with MALSS detection. The columns are well suited to provide signal at low concentration with low molecular weight standards.

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**Introduction of new LB columns**

- Improved polymer
- Decrease in particle shedding

LB base material is polyhydroxymethacrylate

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**Features of MALSS**

- Determines absolute molar mass and conformation of macromolecules
- Measurements are made without reference to molar mass standards, column calibration, or molecular conformation

**Example:**

Poly(diallyl dimethyl ammonium chloride) Elutes with SEC mode

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**Principle of Measurement**

Laser

Scattering intensity is proportional to molecular weight, concentration and specific refractive index (dn/dc)

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**Difficulty of Low Molecular Weight Analysis**

- Particle shedding causes noise
- Signal of low molecular weight is small.
- Current Showex SB-806M (lower) is possible to detect but the baseline noise interferes with accurate measurement.

Improvement of baseline noise is required to find sample signal peak.

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**Comparison of Signal to Noise Ratio (S/N ratio)**

- Achieves analysis from low molecular weight to macromolecular weight.

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**Conclusion**

- We have demonstrated the Showex LB-803 HQ with MALSS detection has very low baseline noise. Low molecular weight polymers that are usually problematic for MALSS detection can be separated with good S/N ratios.
- We have demonstrated the Showex LB-806M HQ with MALSS detection has very low baseline noise. Due to the linear calibration curve it is possible to analyze a large range of molecular weight polymers.

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