



10 октября, 11:00
В актовом зале ИСПМ РАН

пройдет семинар на тему:

SEC and FFF with Advanced Detectors for the Characterization of Natural and Synthetic Polymers

Докладчик:

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Язык семинара: английский

Во второй части семинара будут представлены результаты исследования биоразлагаемых звездообразных полилактидов, синтезированных в лаборатории функциональных полимерных структур.

This seminar provides a comprehensive overview of polymer characterization using Light Scattering:

- **Characterization of polymers: molar mass, conformation, branching**
- **Theory of Light Scattering**
- **Application examples SEC-MALS (including differential Refractometer, online differential viscometer) and FFF-MALS (Asymmetrical Flow Field Flow Fractionation as alternative to SEC)**
- **Copolymer Analysis**

Only multi-angle light scattering (MALS) can determine the absolute molar mass and size distributions of heterogeneous polymers independently of retention time and molecular standards, and regardless of non-ideal column interactions. That's because MALS measures molecular weight and rms radius (a.k.a. radius of gyration) directly from first principles. All that is needed is a convenient means of size-based separation preceding the on-line MALS detector.

Couple a MALS detector and a refractive index concentration detector to a size exclusion chromatography (SEC) or gel permeation chromatography (GPC) system to create a SEC-MALS absolute characterization tool for polymers. Wyatt detectors interface with HPLC systems from all major vendors.

For more advanced separation capabilities consider the advantages of field-flow fractionation coupled to MALS detectors – FFF-MALS. FFF systems separate nanograms to milligrams over sizes from 1 to 1000 nm, without shear or non-ideal column interactions.

Branching ratio of polymers is determined through the relationship between molar mass and size; both are determined simultaneously and independently via multi-angle light scattering coupled to size exclusion chromatography (SEC-MALS) or field-flow fractionation (FFF-MALS).

Molecules smaller than 10 nm in radius require a differential viscometer to determine size or else a dynamic light scattering module embedded in the MALS detector for size measurements.

Multi-Angle Light Scattering in combination with UV and RI detection system may be used for characterizing Co-polymers. Given known polymer responses to each of the two concentration detection signals it is possible to calculate the ratio of concentrations of the two; this information is combined with the MALS signal to determine the molar mass of each polymer in the complex.