Laboratory of soft matter materials and technologies

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Flow-through light scattering photometer with field-flow fractionation (Wyatt):

This setup enables fractionation and subsequent characterization of macromolecules, nanoparticles, and their complexes in solution.

- Molecular weight and size distributions of macromolecules (polymer chains) and nanoparticles from 1 nm to 10 μm
- Absolute measurements – without calibration standards
- 18-angle scattering detector with the possibility of measurements of fast kinetics via static light scattering
- Peltier temperature regulation -15ºC to 150ºC

Static and dynamic laser light scattering spectrometer

This setup enables characterization of structures in soft matter (liquids, solutions, gels, emulsions) from 1 nm to 10 μm, interactions, thermodynamic parameters, and dynamic processes on time scales from 100ns to 10s

- Custom-made spectrometer with 4W argon ion laser (Spectra Physics) and helium-neon laser (CVI Melles Griot), digital correlator (ALV) and temperature regulation with 0.01 ºC precision (Lakeshore)

Programmable preparative and analytical nanoparticle separation (Jouan)

Nanoparticle centrifugal separation and subsequent characterization by scattering and other analytical techniques.

Electrophoretic laser light scattering (Malvern Instruments)

This equipment enables measurement of charge (zeta potential) of polymers and nanoparticles.

Applications:

Patents and patent applications in the field of soft matter materials and technologies:

M. Sedlák, Č. Koňák: Preparation method of polymeric nanoparticles on the basis of poly(ethylacrylic acid) homopolymers. Industrial Property Office of the Slovak Republic. Patent No. 287951. Awarded 27.4.2012.

M. Sedlák, D. Rak: Measurement of the alkane content in alcohols by the method of nanoseggregation in aqueous solutions. Industrial Property Office of the Slovak Republic, patent application PP50002-2014: submitted.