

# **MULTIDIMENSIONAL ANALYSIS WITH FIELD FLOW FRACTIONATION AND FOURIER TRANSFORM INFRARED SPECTROSCOPY**

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## **ABSTRACT**

Innovation in polymer synthesis techniques have led to a production of complex polymers including block copolymers, blends, graft copolymers etc, with unknown chemical composition, functionality and architecture. The task of characterizing these polymeric materials has now become a challenge, and has accelerated the need for hyphenated techniques that will provide adequate information regarding all the different distributions. The increased use of hyphenated techniques has prompted the development of online coupling of thermal field flow fractionation (ThFFF) and Fourier transform infrared spectroscopy (FTIR). ThFFF, is able to separate over both composition and size. FTIR provides simultaneously correlated chemical information.

Measuring the correlated chemical composition and the molecular weight in an online manner is preferred to manually collecting fractions and characterize them one at a time. The presented coupled method will decrease the time needed in the labour consuming FFF and subsequent analysis by FTIR, offline. Coupling FFF with FTIR is valuable when there are compositional changes over elution volume. By selecting spectral bands that are unique to each solute, one can see and measure the distribution of the individual solute components across the elution profile, even when those components may not be chromatographically resolved. In one integrated procedure, THFFF -FTIR can provide molecular and structural characterization of complex multicomponent samples.

The setup of the method will be presented as well as data treatment and example measurements.