

## HYPHENATION OF GPC/SEC WITH FTIR SPECTROSCOPY

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### ABSTRACT

The measurement of batch values is not sufficient for the analysis of advanced polymer materials. Size exclusion chromatography is the standard method to determine the molecular weight distribution and allows for hyphenation with other techniques – like viscometry, light scattering techniques, liquid adsorption chromatography or even spectroscopy – to gain a detailed insight into the molecular characteristics of the material. Coupling SEC with another type of chromatography or spectroscopy is of high interest, as it provides two dimensional results. Different methods have been reported; the general drawbacks are high effort and high dilution, which leads to a low sensitivity in detection.<sup>1</sup> The coupling of SEC and infrared spectroscopy has been investigated and was even commercially available in the 1980's and 90's. The major problem is intense solvent signals in the resulting spectrum. Therefore, two general approaches can be differentiated: measurements in flow cells and solvent evaporation techniques. In recent years the topic was re-investigated. Modern spectrometers allow for a high enough sensitivity to successfully couple it online to SEC.<sup>2</sup>

The solvent evaporation technique underwent a similar revival and is now commercially available again from different suppliers. We investigated modern analytical questions from different fields with SEC-FTIR and compared the potential of the method.

### References:

<sup>1</sup>Pasch, H. *Polym. Chem.*, **2013**, *4*, 2628-2650.

<sup>2</sup>Beskers, T.F.; Hofe, T.; Wilhelm, M. *Polym. Chem.*, **2015**, *6*, 128-142.