

Automatic versus manual (interactive) data evaluation in GPC-SEC analysis

Application

Heinz Goetz

Abstract

It is widely accepted among polymer analysts that the data acquisition part of the analysis can be automated with modern, state-of-the-art GPC hardware without any loss of accuracy and precision. Regarding data evaluation there is still some discussion on whether automatic or interactive baseline setting should be used. In this note we have analyzed a technical polystyrene sample 10 times with interactive and another 10 times with fully automatic data evaluation. The figure shows an overlay of the 10 chromatograms for the technical polystyrene

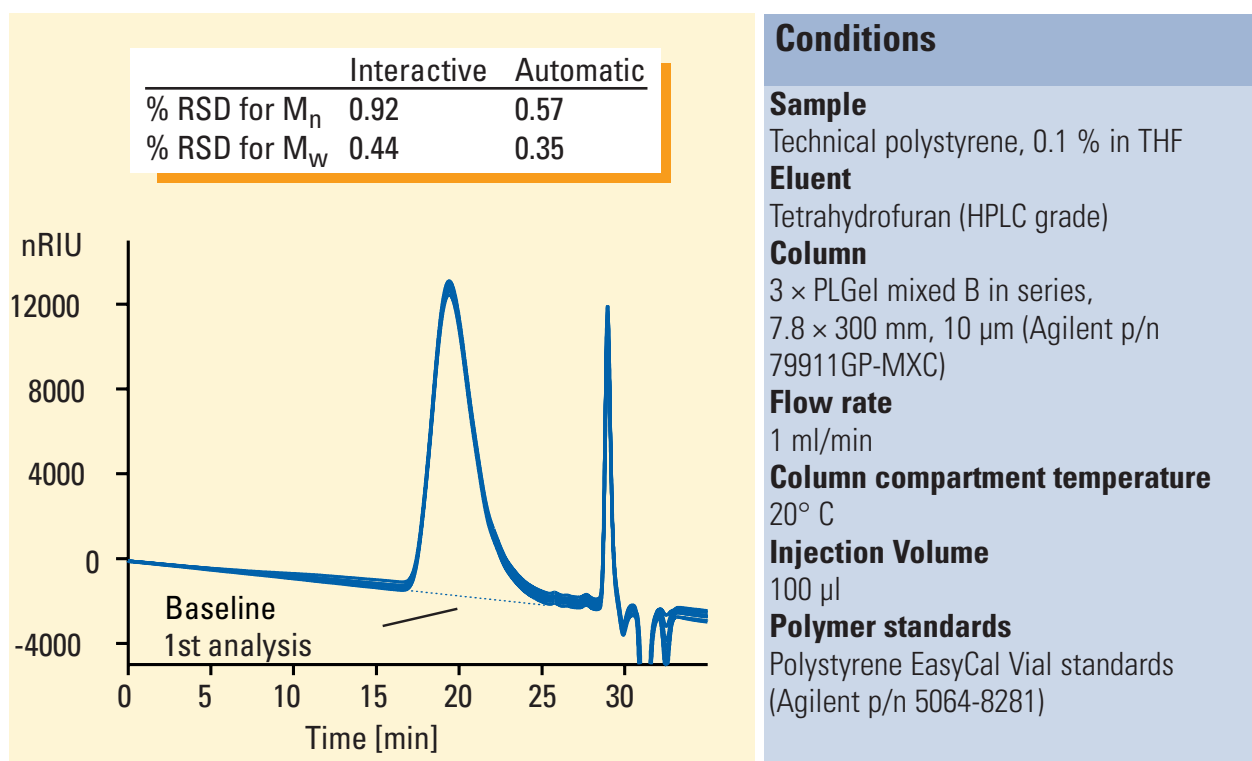


Figure 1
Technical polystyrene sample analyzed with interactive and automatic baseline



Agilent Technologies

Innovating the HP Way

sample and the intraday precision data for automatic and interactive baseline setting. We see that the precision data for the automatic mode is slightly better than for the interactive mode for both M_n and M_w . We also found a similar superiority for other polymers. This is however not the case for every sample, such as a polymer with a strong tailing peak or when the peak height is small due to low sample concentration or low refractive index.

In most cases the ChemStation's *Enhanced Integrator* is perfectly suited to detect the start and end of a polymer peak correctly and to ensure reliable automation. It provides the following improved capabilities:

- optimized baseline tracking using parameters from the individual method and data files,
- better peak allocation,
- additional initial parameters to remove noise-generated peaks
- ease of use—the *Enhanced Integrator* algorithm has a new user interface based on tool bars and automatically focuses on key information.

Typical advantages of completely automated analysis (from data acquisition to reporting) are:

- often at least similar precision,
- less room for human interpretation and errors,
- higher traceability and consistency, and
- improvement of efficiency by freeing trained staff from time-consuming work

Equipment

Agilent 1100 Series GPC-SEC system

consisting of

- vacuum degasser for efficient degassing of the mobile phase
- Isocratic pump with large solvent cabinet
- Autosampler with single valve design
- Thermostatted column compartment for precise column temperatures
- Refractive index detector with automatic recycle valve
- Variable wavelength detector, 254 nm, standard cell
- ChemStation Plus with GPC-SEC data analysis software

Heinz Goetz is an application chemist at Agilent Technologies, Waldbronn, Germany

For more information on our products and services, visit our worldwide website at <http://www.agilent.com/chem>

© Copyright 2000 Agilent Technologies
Released 09/2000
Publication Number 5988-0115EN



Agilent Technologies

Innovating the HP Way