Technical Overview

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Guided Detector Setup for All Detector Types

Introduction

To evaluate measurements and obtain correct results using light scattering detectors or viscometers, several factors, parameters, and detector constants must be determined. These factors range from inter-detector delay to MALS normalization coefficients. Even simpler setups with two concentration detectors require at least the inter-detector delay to obtain comparable results for both detector signals. This technical overview describes how all the necessary parameters for all detectors and combinations can be determined using the Agilent WinGPC Software detector setup dialog box.

Experimental

The detector setup dialog box can be found in the Method window menu by clicking **Method**, then **Detector Setup**. WinGPC will automatically identify which detectors are defined in the method and adjust the detector setup dialog box accordingly. WinGPC needs an evaluated measurement of an adequate standard and information related to concentration, injection volume, molar mass, dn/dc, and [η]b (bulk intrinsic viscosity). When available, WinGPC takes this information from the sample editor and makes it available for confirmation or editing in the dialog box (Step 2, Figure 1).

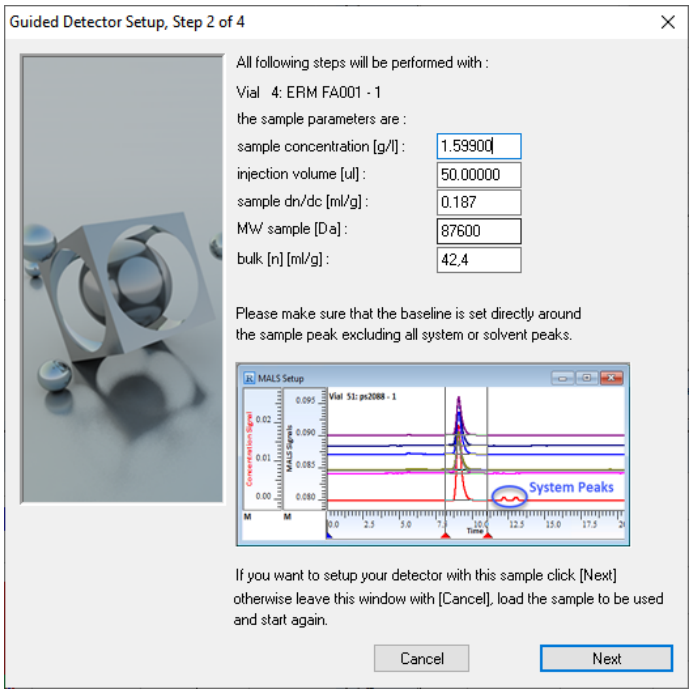

Figure 1. Step 2 window in the Guided Detector Setup

Sample information is only required in the context of molar mass-sensitive detection and will be skipped when only concentration detectors are configured in the WinGPC method. In this case, only inter-detector delay will be determined. It is preferable to add as much sample information as possible to the sample editor. These parameters are saved together with the measurement and are directly made available to the detector setup dialog box.

Table 1.

Parameter	Application	Prerequisites
Inter-Detector Delay	All detectors	Narrowly distributed standard
Normalization Coefficients	For MALS detectors only	M_w approximately 100,000 Da (isotropic scatterer)
Concentration Detector Constant	Evaluation of viscometry and/or light scattering measurements; calculation of slice concentration c_i	Exact sample concentration and injection volume (injected mass), sample dissolved completely, no side or system peaks, dn/dc of the standard in the used eluent
Light Scattering Detector Constant	LS detectors	Exact M_w must be known
Viscometry Detector Constant (= DPT-Sense)	Viscometers	[η]b must be known

DPT-sense is only needed to measure the exact intrinsic viscosity values. Molar mass averages obtained by universal calibration are unaffected by DPT-sense, as long as it is constant (e.g., default = 1).

Click **Finish** to apply the parameters determined by WinGPC to the actual measurement (Figure 2). Inter-detector delay and concentration detector factors are entered automatically for the relevant detector in the WinGPC method. For light scattering detectors and viscometers, the corresponding constants are shown in the resource tree on the left. Right-click the detector and select **edit** to access these constants. To use these parameters for future measurements, click **Save as default method** before running further analyses.

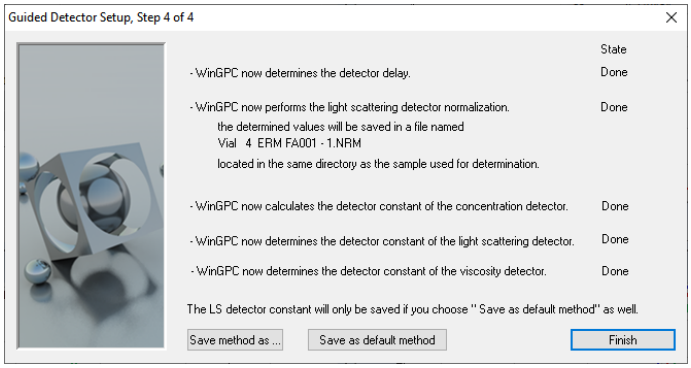

Figure 2. Step 4 window in the Guided Detector Setup

Conclusion

The Agilent WinGPC Software detector setup dialog box helps users to define all necessary parameters for detectors and detector combinations. Using existing method and sample data, the four-step process involves automatic detector identification and determination of factors such as inter-detector delay.

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