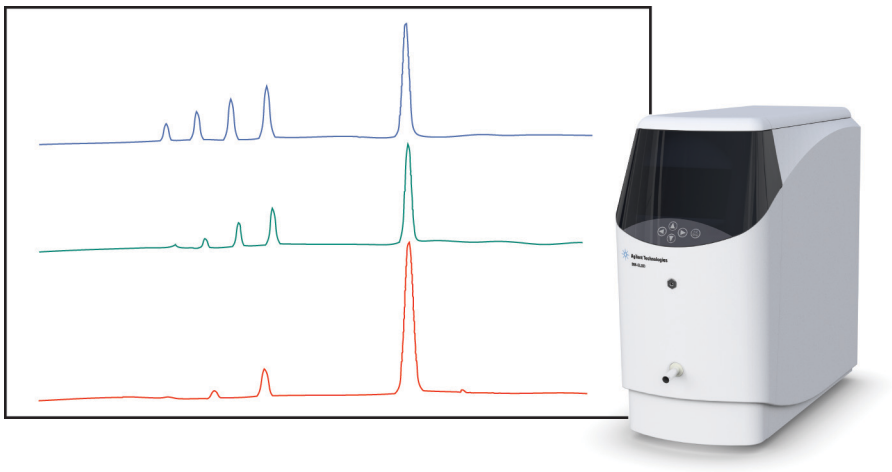
Sensitive analysis of parabens using HPLC with evaporative light scattering detection at subambient temperatures

Application Note

Food testing and agriculture, consumer products, pharmaceuticals

Author

Stephen Ball
Agilent Technologies, Inc.
Craven Arms, UK



Abstract

This Application Note describes how the Agilent 385-ELSD Evaporative Light Scattering Detector can be operated at subambient temperatures to successfully detect semivolatile parabens. Parabens are esters of para-benzoic acid and widely used as food additives and synthetic preservatives in cosmetics and personal care products, and in pharmaceutical formulations. These low molecular weight compounds are relatively volatile but can be easily detected by the 385-ELSD through careful adjustment of operating conditions and detection parameters, thereby conserving sample integrity and achieving maximum sensitivity.

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Introduction

Agilent evaporative light scattering detectors respond to all compounds that are less volatile than the mobile phase. At higher operating temperatures, semivolatile analytes may evaporate along with the eluent making detection difficult or even impossible. The Agilent 385-ELSD Evaporative Light Scattering Detector can be operated at very low temperatures (or even ambient temperature) so that loss of semivolatile sample components can be minimized, preserving sample integrity and offering maximum sensitivity. The 385-ELSD can also operate at higher temperatures to reveal the presence of more volatile compounds.

Parabens are esters of para-benzoic acid and widely used as food additives and synthetic preservatives in cosmetics and personal care products, and in pharmaceutical formulations. Common types include methyl paraben (E218), ethyl paraben (E214) and propyl paraben (E216). These low molecular weight compounds are relatively volatile but can be easily detected by the 385-ELSD.

Experimental

Instrumentation

Column:	Pursuit C18, 150 × 2.1 mm
Detection:	Agilent 385-ELSD Evaporative Light Scattering Detector
Nebulizer temp:	30 °C
Evaporation temp:	as given in Figure 1
Gas flow:	1.4 SLM

Materials and reagents

Eluent A:	Water
Eluent B:	Acetonitrile

Sample preparation

Sample:	Parabens

Conditions

Flow rate:	0.2 mL/min
Gradient:	5–70% B in 5 min, 70–95% B in 12 min

Results and discussion

These low molecular weight compounds are relatively volatile but can easily be detected by operating the Agilent 385-ELSD Evaporative Light Scattering Detector at low temperature, such as 30 °C. However, further improvements in the recovery of the lower molecular weight, methyl paraben, can be achieved at subambient temperatures of 20 °C , as shown in Figure 1.

Conclusion

By carefully adjusting the operating conditions and detection parameters, the Agilent 385-ELSD detects semivolatile parabens, conserving sample integrity and providing maximum sensitivity. The 385-ELSD Evaporative Light Scattering Detector surpasses other ELS detectors for low temperature HPLC applications with semivolatile compounds. Its innovative design represents the next generation of ELS detection technology, providing optimum performance across a diverse range of HPLC applications. The unique gas control of the 385-ELSD facilitates evaporation of high boiling solvents at very low temperatures. For example, 100% water at a flow rate of 5 mL/min can be removed at 30 °C. The novel design of the 385-ELSD achieves superior performance compared to detectors from other vendors for the analysis of semivolatile compounds.

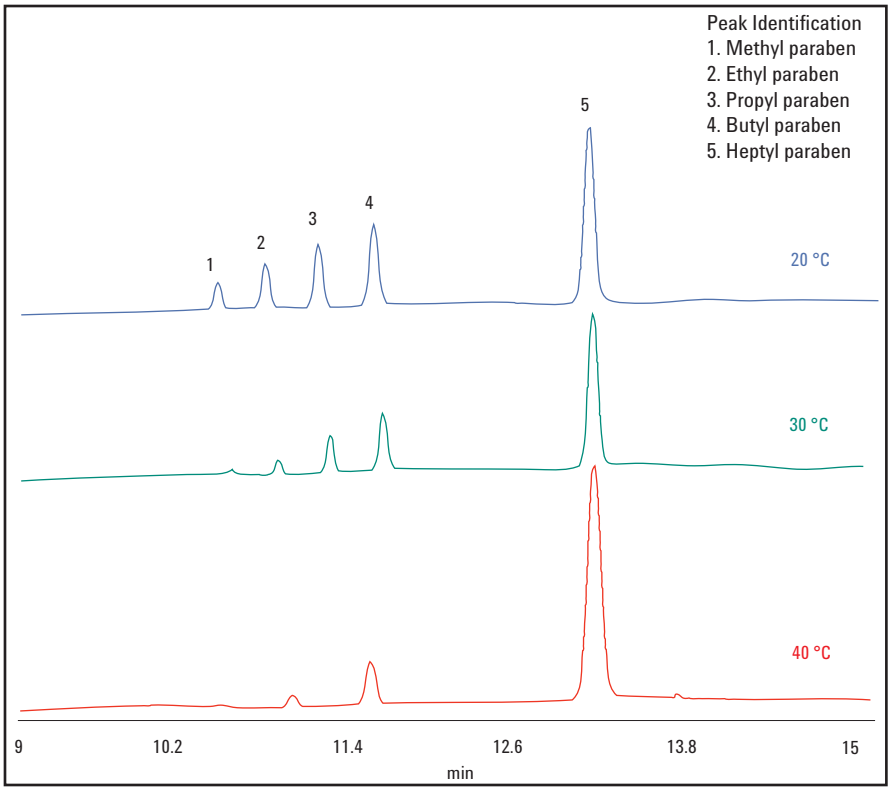

Figure 1
Analysis of parabens using low temperature Agilent 385-ELSD Evaporative Light Scattering Detector.

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